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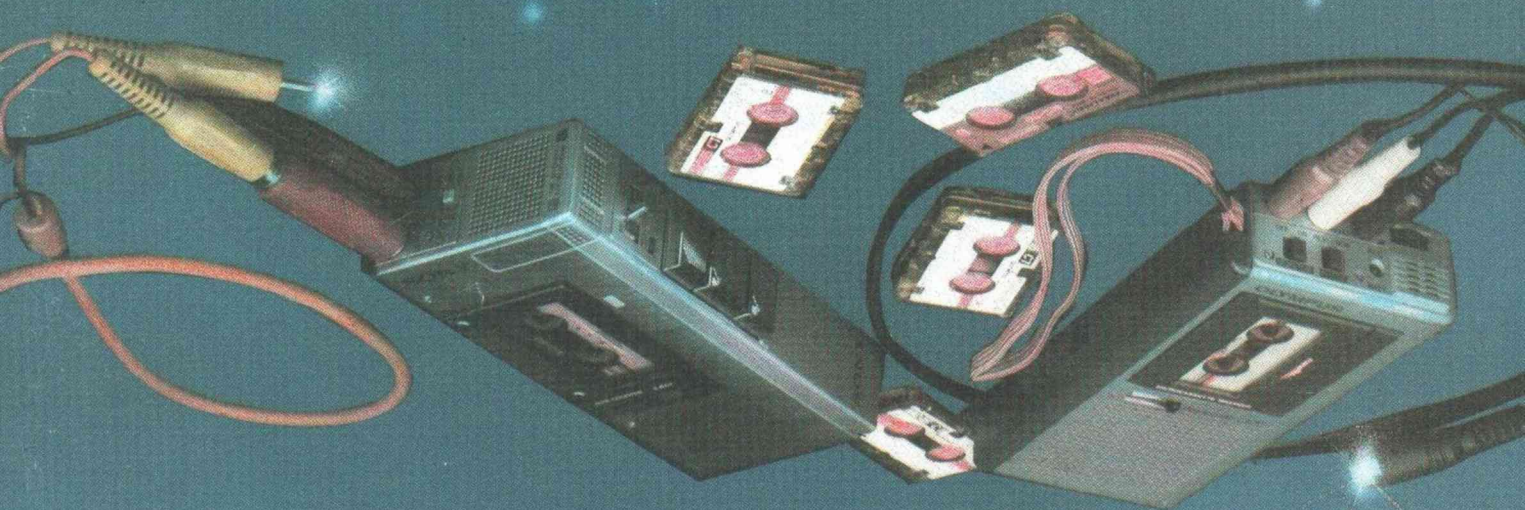
PORTABLE 100

The magazine for
Model 100* users

JUNE
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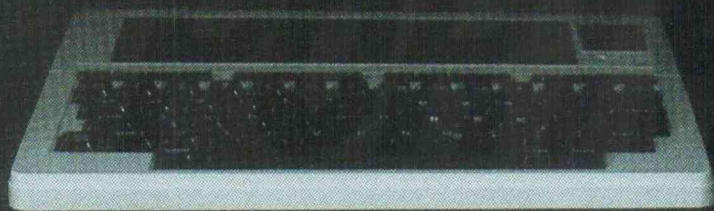


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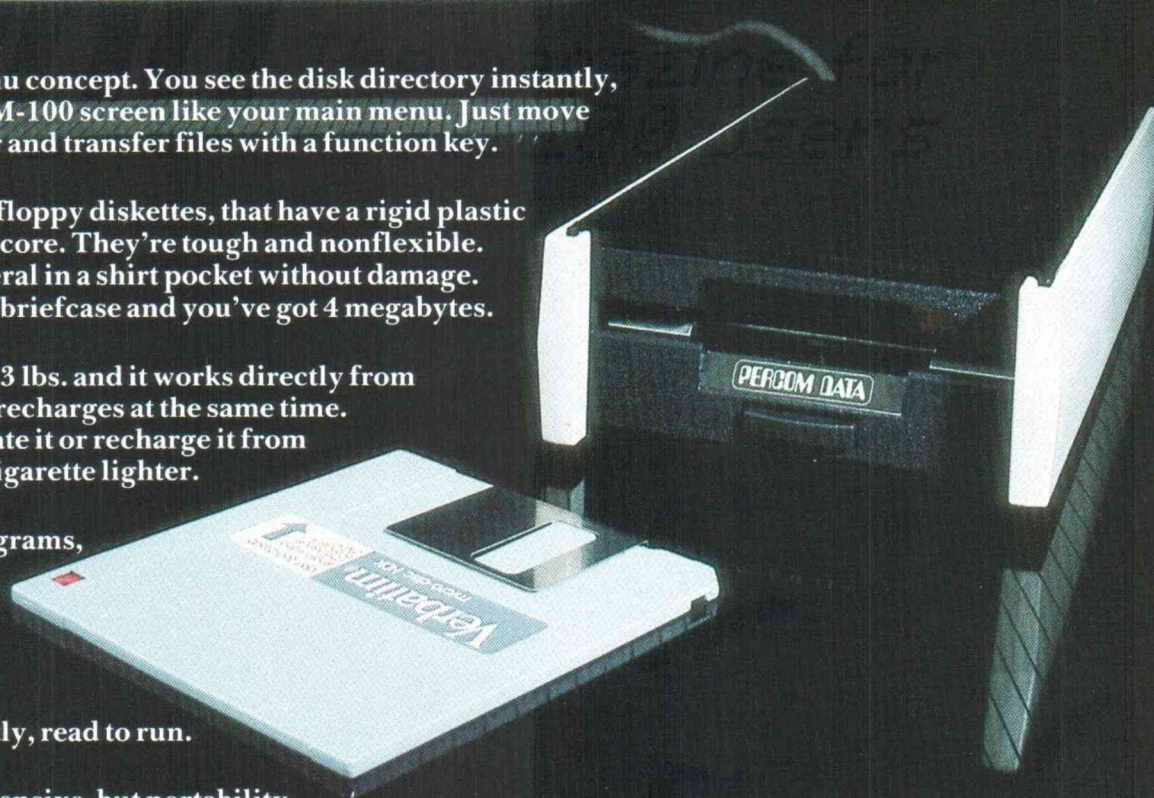
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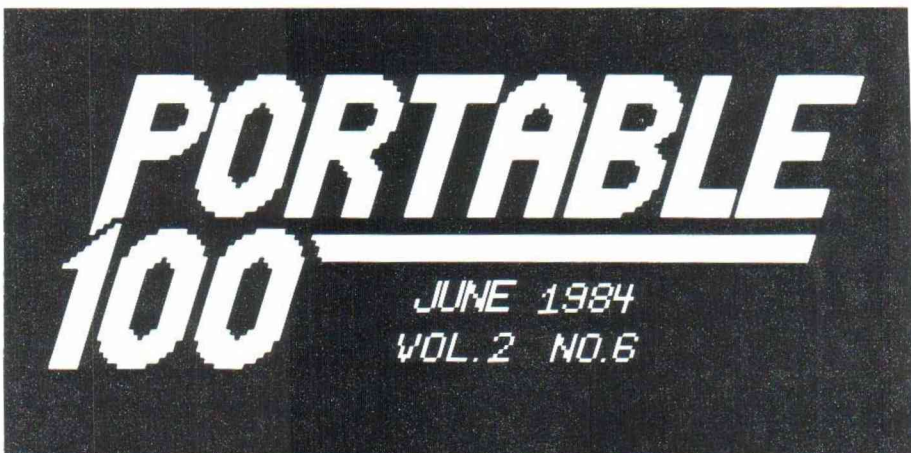
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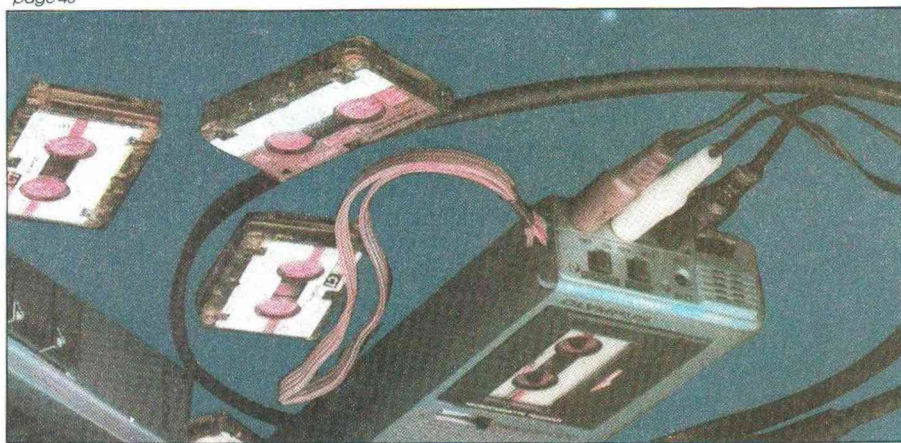
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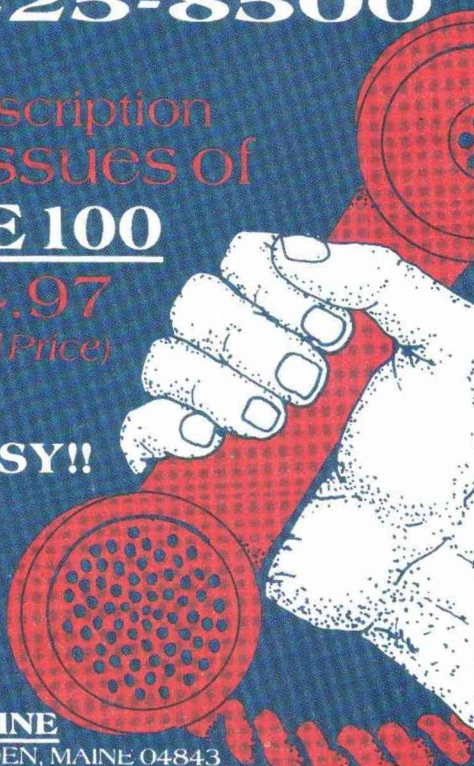
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Model 100 users

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PREVIEW

JOHN P. MELLO JR.



Members of the Model 100 Special Interest Group on CompuServe will immediately recognize the name Peter Stanwyck. Not only is Peter an obsessive programmer (he says he learned to program by locking himself in a room with his computer and with plenty of breakable objects within reach), but an impenitent gadfly and fire-breather, an *enfant terrible* in a nursery crammed with cherubs.

An attorney by trade (he graduated from Berkeley's Bolt Hall, the West Coast version of Harvard Law School, and runs a business law practice in Oakland), he signs his bulletin board messages with his nom de SIG: End User. For some of us, end user is just an ugly slug of computer marketing jargon designed to make observers of the state of the language gag. But for Peter, who started computing with a TRS-80 Model I he won in a poker game, it's a cause celebre.

This month, Peter brings his cause to *Portable 100* in a column called, appropriately enough, End User (page 88). We don't always agree with Peter's views, but we think you will find them provocative and valuable in assessing the services and products pitched to you every day by the computer industry.

By now, many of you have heard of the third Kyocera microcomputer to enter the American market, the Olivetti M10. To learn about the features of this machine and how it will be positioned in the existing lap computer market, take a look at "The Italian Invasion" starting on page 40.

Another familiar figure on the Model 100 SIG is Bill Templeton, who's become a bit of an expert in getting 100s to work with microcassette recorders. Getting the two gadgets to talk to each other takes a small hardware mod (page 48), but it's worth the effort to have a storage medium that

complements the size of the 100.

You've probably seen those rotary index dialers they sell in electronics and telephone stores. You store your phone numbers in them and at the press of a button, your call is dialed. But my 100 does that, you say. Not quite. As Ron Balonis (page 34) notes,



"for regular dialing, it's easier to do it yourself" than to use TELCOM. Ron's solution was to write a program to make the 100 a rotary index dialer. Then all you do is move the cursor through an alphabetical list (automatically sorted by the program) and press enter.

Last month *Portable 100* covered some new devices for mass storage on the 100. For 100 owners with a TRS-80 Model I, III, or 4, Jeff Levin (page 54) describes another. Jeff explains how to configure the LDOS operating system to let the 100 freely use the disk drives of the bigger computer. You also may

be able to use the desktop as a remote terminal for your MEWS.

One difficulty with managing a data base with the Model 100 is obviously storage. Tandy's Disk-Video Interface, by giving the 100 a disk drive, is a step toward solving that problem. This month, Bill Walters (page 28) begins a series on using the 100 and the DVI.

More and more each day, the information revolution seems to be taking its course. What is that course? Part of it can be found in the web of communications services available to personal computer owners. Bill Loudon (page 25) takes a look at some of these services and sketches what they have to offer in his Telecomputing column this month.

In his first installment in his series of columns on building a program generator, Dave Busch showed you how to open and access RAM files. This month, Dave (page 18) will take things one step further and illustrate how to alter a RAM file through software to remove remark statements in a program.

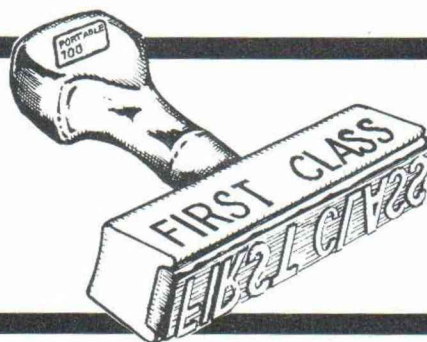
Did you ever wonder why the 80C85 is at the heart of your 100 and not a Z-80 or 6809? Jake Commander takes a look at this question starting on

page 16.

If you take your computer with you, you've got to have something to take it with you in. Take a look at what casemakers are offering 100 owners on pages 22 and 23.

And in our review section (page 61), we check out two calculator programs — one from Tandy and another by The Portable Computer Support Group; an outboard, mobile power source; the financial analysis package produced by York software; a word-processing package from Discovery Computer Systems; and Tandy's executive calendar program. ◀

MAIL.100



Editor's Note: In addition to letters from our readers, we also include in Mail.100 letters from CompuServe and The Source. Those message writers are identified by their CompuServe (CIS ID) or Source (STC ID) identification numbers.

THREE READERS NEC CONNECT

I'm one of your many readers who owns the 100's first cousin, the NEC PC-8201. I think you're doing a fine job and users of both machines can benefit from reading *Portable 100*.

Andrew F. Zarchy
Studio City, CA

I'm a satisfied owner of the PC-8201 and I'm anxious to see *Portable 100* run the ROM map for the NEC machine.

Although the two machines are very similar, there are differences between the two operating systems. Apparently the PC-8201(A) is an upgrade from their earlier desktop PC-8001. The two PCs have similar sets of tokens which are different from the 100's. I've enclosed a token-table for fellow PC-8201(A) owners. (See tables 1 and 2).

Sidney Lee
Downsview, Ontario

I'm a new subscriber to your magazine and am a NEC-8201A user. Here are some comments on some of the NEC-related articles of the past months.

I'd like to take issue with Terry Haas' letter (February 1984, page 10) where he says the NEC has no graphics characters. Although the user must define the majority of them, only three are fixed, there is more graphics capability in the NEC than their manual indicates. I discovered this by accident.

The character generator has a bug which creates characters 161 and up, instead of jumping to 224. Characters 128-159 are entered by pressing GRPH and another key (a-z, @, \, <, >, /, and

[]); 160-191 are SHIFT+GRPH and another key. This works only with the shift keys, not the cap lock key. I have created characters 131-240 with no problems by modifying the CHRDEF program supplied to write to the addresses these characters reside. Probably all values 131-255 can be defined this way, but I haven't gone that far.

I'd also like to add to Danny Goodman's review (January 1984, page 34) that the ROMs have more similarities

than differences. The "terrible trio" of Suzuki, Hyashi, and Ricky also are found in the NEC's ROM. It has the added commands of COLOR, DSKO\$, DSKI\$, DSKF, FORMAT, LFILES, and LOC as tokens for the support of the disk drive and CRT additions. I've been able to save part (over 4K worth) of a Basic program, in ASCII, at 9600 baud by saving them from the main menu... another use of the menu commands.

The following are one byte tokens. (Byte 128-255)

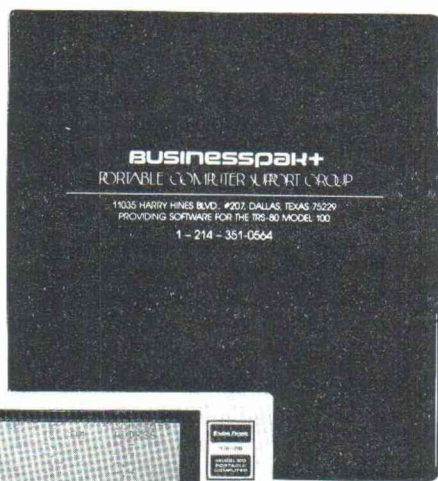
	8	9	A	B	C	D	E	F
0		STOP	WIDTH	PRESET	BLOAD		ERR	>
1	END	PRINT	ELSE	PSET	BSAVE		STRINGS	=
2	FOR	CLEAR		BEEP	DSKO\$	SAVE	USING	<
3	NEXT	LIST		FORMAT		LFILES	INSTR	+
4	DATA	NEW		KEY				-
5	INPUT	ON		COLOR	OPEN	LOCATE		*
6	DIM		ERROR	COM			CSRLIN	/
7	READ		RESUME	MAX		TO	OFF	^
8	LET	POKE	MENU	CMD		THEN	DSKI\$	AND
9	GO	CONT		MOTOR		TAB(INKEY\$	OR
A	RUN	CSAVE	RENUM		CLOSE	STEP	TIMES	XOR
B	IF	CLOAD	DEFSTR	EDIT	LOAD		DATES	EQV
C	RESTORE	OUT	DEFINT	EXEC	MERGE			IMP
D	GOSUB	LPRINT	DEFNG	SCREEN	FILES			MOD
E	RETURN	LLIST	DEFDBL	CLS	NAME	NOT	STATUS	\
F	REM		LINE	POWER	KILL	ERL		

Table 1. NEC One-Byte Tokens.

The following tokens (byte 0- byte 127) are preceded by FF (Hex). They are two-byte tokens.

	0	1	2	3	4	5	6	7
0		INP	CSNG					
1	LEFT\$	POS	CDBL					
2	RIGHT\$	LEN	FIX					
3	MID\$	STR\$						
4	SGN	VAL				GO		
5	INT	ASC						
6	ABS	CHR\$	DSKF					
7	SQR	PEEK	EOF					
8	RND	SPACES	LOC					
9	SIN		LOF					
A	LOG							
B	EXP	LPOS						
C	COS							
D	TAN							
E	ATN							
F	FRE	CINT						

Table 2. NEC Two-Byte Tokens.



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I strongly agree about the style of the manuals; they should be rewritten. As for software support, the 100 has an advantage, but the systems are so similar it's not hard for an author to modify his package for the NEC.

My opinion is the 100's modem is a better choice for those wanting a truly portable system which can easily connect to another computer. The NEC will turn into a "snarly" mess when a lot of cables are hitched to it for connecting to the line of peripherals offered.

I subscribe to *Portable 100* mainly be-

cause the majority of articles are appropriate to both systems. I think it'd be a natural extension to add coverage of the 100's fraternal twin's idiosyncracies.

William R. Tyler
St. Paul, MN

AMPI DISAGREES

(Editor's Note: On page 68 of our May 1984 issue, Scott L. Norman reviewed TPLAN/NPLAN by American Micro Products Inc. In addition to AMPI's remarks below, the firm has informed Portable 100

they have prepared a point-by-point rebuttal of Scott's review. Readers interested in that rebuttal can obtain it by writing to American Micro or Portable 100.)

None of the objections *Portable 100* raised, individually nor collectively, detract enough from our program to merit the type of review you've given us. American Calc is the best spreadsheet currently available for 100 and 8201A users. This opinion is shared by *Creative Computing's* editor, David Ahl (see *Creative Computing*, June 1984). In a recent phone conversation, he informed us that after testing numerous lap-sized spreadsheets, he found American Calc to be the most competitive.

From December to the present we've shipped hundreds of spreadsheet programs. During this time only two customers have asked for, and promptly received, refunds. How many complaints have you received? Certainly if the product is as deficient as *Portable 100* claims, you should have received numerous negative inputs.

The fact is, American Calc is an excellent full-featured spreadsheet that does exactly what it's advertised to do. Simply stated, the product has all the features one would expect from a first rate quality software company like AMPI. In addition, it has the capability of printing out all spreadsheet formulas and it has the largest matrix capacity of any lap-size spreadsheet. These benefits far outweigh any of the objections your reviewer mentioned.

Unfortunately, *Portable 100* chose not to emphasize this but rather to focus on some rather trivial points. One would assume, after reading your review, that American Calc isn't a viable product. I'd wager to say it is the best-selling lap-size spreadsheet.

We acknowledge our program, like most programs written, has several faux pas. We, however, don't apologize to you or any of our valued customers. The software products developed by American Micro are of the highest quality and we, quite frankly, don't intend to incorporate any changes in our current spreadsheet.

Most of the damage you have caused us could have been avoided if we were allowed to make a rebuttal in the same issue as the review. Now, two or three months later, it'll be almost impossible to recover.

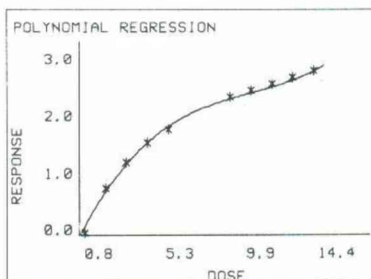
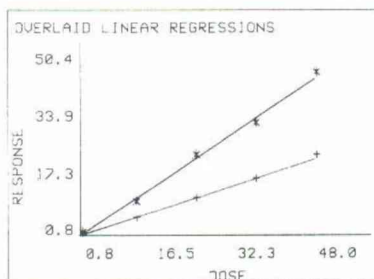
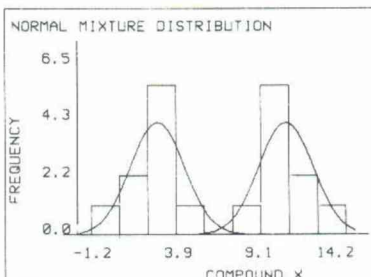
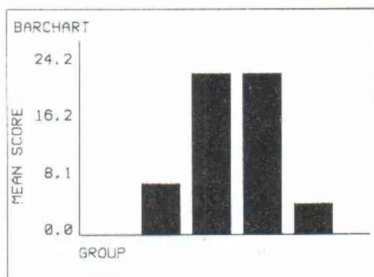
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This does, however, bring up an interesting point. If *Portable 100* feels that allowing us to immediately respond to a negative review will, in some way, compromise its integrity, how then can it continue to accept our advertisements? It seems hypocritical of you to tell your readers how defective our program is in one section and then run a full-page advertisement soliciting sales of this product. We deserved a much fairer review than you gave us.

William McNeil, President
American Micro Products, Inc. (AMPI)

NO FREE LUNCH

In regards to the article by Jesse Bob Overholt (March 1984, pg. 36) in which he refers to the "generous folks at Tandy tower" giving me a "data-base program absolutely free," I must admit I paid nearly \$1200 for my 100 with full memory. I don't consider that "absolutely free" at all!

Brad Baxter
Athens, GA

NO RESPECT

I've little respect for any publication that's as mistake-laden as yours and I intend to stop buying it until the quality improves. The only part worthwhile are the advertisements. The worst thing about this is it reflects poorly on the usefulness of the 100; it deserves better.

John Shafer
San Francisco

COMMANDER STILL JARRING

You write a good mag. Jake Commander's material is usually good; Bender's Basic is very useful. But...

Jake's December 1983 column (*CompuChurch*, page 24) and his November 1983 column (*Perils of Portability*, page 20) are an insult to paying subscribers. I wish he'd concentrate on what he knows and leave the comedy to others.

Let me also add, I appreciate very much your efforts in the 100 SIG. It's great!

J. Bixby
CompuServe 70465,1045

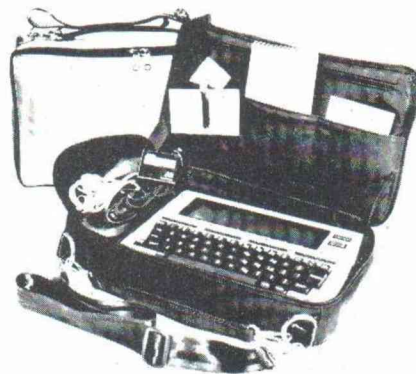
Include more technical stuff for us old hackers. After surveying four past issues, I'd say you're moving in that direction, but you've a long way to go before reaching the quality of *80 Micro*.

On the other hand, I'd caution you to avoid the chronic editorial diarrhea that infected Wayne Green when he was publisher of that excellent magazine. I notice Jake Commander is one of your regular contributors and worry he may have brought the germ with him.

I've always thought Jake a little weird after reading a derogatory remark he made about structured programming. Remember, normal people are slightly afraid of computers and see them as intrusions into their lives. Running off at the mouth about electronic universities and such brings visions of Big Brother to mind. Likewise, Jake's rather irrelevant treatise on the *CompuChurch* may be appreciated by some of us old hands, but I wonder about the solid citizen-types who are sure to be readers too.

W.B. Brown, Jr.
New York, NY

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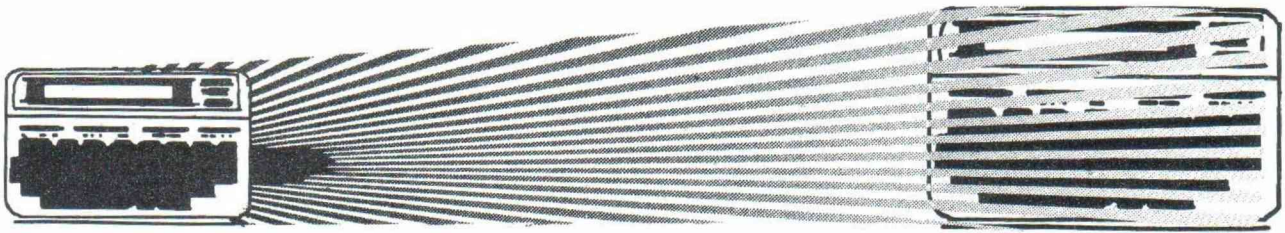
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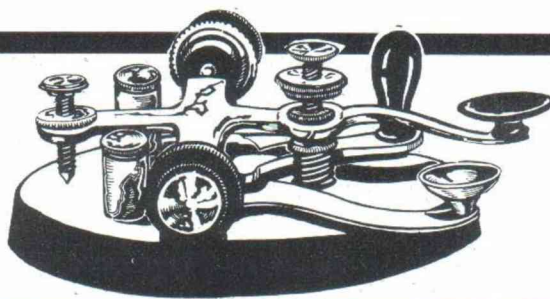
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THE WIRE



L.A. COMDEX

EXPERTS PREDICT 100 OUTMODED BY THIS FALL

By Mike Greenly

Have you thought about what you'll do when your Model 100 is outmoded by new technology? A friend of mine, the "M100 Maniac," said when full-size desk computers are surpassed, they will be an irritant in all their embarrassing clunkiness.

But when some day he buys a more advanced lap computer (he said this softly, lest his Model 100 hear him), he'll still feel special about the pal he's taken everywhere.

My friend mused about this question as though decades would pass before the original 100 had real competition (including from Radio Shack itself). Now that I've told him about the Comdex Lap Computer Seminar, he's looking nervous around the edges.

The seminar, "Lap Computers: Look Before You Leap" was offered in April in Los Angeles at Comdex by Gene R. Talsky, president of Professional Marketing Management Inc., and by Richard Dalton, the editor of the "Whole Earth Software Review/Catalog."

There's little question portables and transportables are one of the shining growth areas of the computer business. Talsky, in his opening remarks, identified three types of portable computers:

- "Hand Held" (limited screens and functionality, with very

specialized applications like inventory control.)

- "Suitcase/Transportable" (which Talsky believes will replace desktop computers, with standard removable storage and a 25-line-by-80-character CRT screen.)

- "Lap/Briefcase" computers (Talsky feels this is the real future of portables, which is why it's the subject of this Comdex seminar.)

New developments now include Strategic Technologies, offering the first plasma display (extremely bright and clear) in a briefcase. Removable storage is another trend. The Sharp 5000 for example has bubble memory cartridges, though the technology still seems very expensive (\$80 for 16K of RAM cartridge).

The next generation of lap portables will have much more memory (512K) and full size display screens, with 80 columns of text.

How soon will we see these predictions coming true? Incredibly, in only the next six months to a year! Talsky was asked about the new Apple portables (the Apple IIc was not yet released). Answer: "unofficially", both of the Apple machines coming out in 1984 seem "eminently sound" to both speakers (both had seen them). In fact, Dalton had one of the Apple IIc's in his office at that moment. He endorses the machine with certainty.

A Japanese company has just shown a 2-inch color liquid crystal display, we are told. It won't be here in the next six

TASKY AND DALTON LOOK AT LAPPERS, COMPANY BY COMPANY

Xerox: This lap unit can't be selling much, Dalton believes. It's been marketed through Diners Club at around \$4500. "I think they've got a real loser on their hands," he said.

Sord: Dalton said it has an integrated tape, which is nice. It's a good product, but it will have trouble later in the year when capable portables will come out. "I can say that you'll be able to get a full-screen portable computer for less than \$2,000 this year. Sord will have trouble competing."

Gavilan: A wonderful little machine, Dalton said, but who knows whether we'll ever really see one. The best thing about it is the beautifully integrated software. But so far it's "vaporware" — we haven't really seen it on the market. "My fear is that Gavilan will horse around with this product so long that two or three other companies will jump into the market and steal their lunch," he said. They may have delayed this product out of existence."

Grid: Another option — "beautiful, sexy machine. The

electroluminescent screen on it is the best I've seen anywhere." But you're likely to spend \$10,000 before you're through! The software is "elegant". But Grid, too, will be heavily impacted by the next round of lap-size portables.

NEC: It has "the most wretched documentation known. The documentation weighs more than the computer."

Model 100: "There's no reason in the world not to use a Model 100 for telecommunications. Their communications are fairly easy."

Teleram 3100: Dalton showed a photograph of this machine, with a wide array of special function keys. That's great for the applications it can do; but it's terrible if you try to download anything and use it in another machine.

Dulmont Magnum: An Australian system, 80186 based, with removable ROM-packs of up to 256K memory! The smart manufacturers will leapfrog to this processor, Talsky feels. ◀

—Mike Greenly

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months, but as it gets larger and cheaper, Dalton said, it will be "a very sexy item."

Prices are coming down, he predicted, noting that NEC has a hand-written sign at their Comdex booth lowering their lap portable's price to \$599 to compete with Radio Shack's April price decrease.

Full screens, not just tiny ones, are coming by fall, he confirmed. Full-size screens help software compatibility, letting portables use "real" software programs with no adaptation.

However, partial screens, like the Model 100 at a low price \$600 is a "hell of a deal" for students, he said. The Radio Shack 100 is selling in the hundreds of thousands at this point, Dalton said. "I was in the press room at Comdex in Las Vegas," Dalton said, "and there were six reporters with their Model 100s!"

"A very key development before the end of the year is this," he said, holding up his American Express card. "Technology will allow us to have memory on strips like the back of your credit cards. Look for that by the end of the year. Think of your American Express card as a software medium to insert into the back of a portable computer!"

"We hear that IBM is planning a 2-inch optical disk for some of their portables of the future. You could probably have a whole encyclopedia tucked under your arm!"

"I guarantee there'll be a lot of public interest in portables after the Apple IIC," we are told. "The promotional campaign will be even bigger than Macintosh. Lap-size portables will be in everyone's minds over the next six months." "Macintosh, at 15 pounds and a canvas bag, is a low-price competitor to the transportable computers. And there are people working on battery packs for it."

"A great number of people will be involved with computers for no other reason than electronic mail and computer conferencing," Dalton predicted. "This is where portables will come into their own."

"Communications is really in the dark ages just now," Dalton said. "I couldn't believe how much garbage you have to go through to send a simple electronic message. It should be pure simplicity. And hardware that simply lets you do that – easily – will be a market by itself."

"FM-side band and cellular radio will also open up a lot of flexibility. No longer will you be under the tyranny of the phone company."

Dalton's closing prediction: Look for Apple, HP, Radio Shack, maybe IBM, and a number of Japanese companies to bring out advanced lap computers this year. You're going to see big growth!

Sitting there, taking down all these notes – occasionally being asked by the Speakers to comment about my Model 100 – I wondered what the room would sound like filled with dozens of machines clacking at once.

I forgot to ask when the "super silent" models would be here. Or, conversely, "talking" ones, like lap robots with keyboards, (I won't think about that idea too closely!)

Judging by the feverish industry progress reported in the Comdex seminar – if you can think about it, someday your portable will do it! ◀

Mike Greenly is president of Mike Greenly Marketing, 235 East 22 St., New York, NY 10010, and known for his interactive reporting on The Source.

L.A. COMDEX

SORD PRESIDENT SHIINA: TALKING TO A GENTLEMAN

Friday morning at Comdex I was testing out the new Sord lap computer at the Japanese Company's booth.

Hovering on the outside, around the ring of portable machinery, were the salesmen from Japan. I was assisted by Takayoshi Kurokawa, the assistant marketing manager of the New York office on Fifth Avenue. In English barely acceptable, but with an eager seriousness that won my respect, he explained that the Sord lap computer had some interesting new features: It has a multi-relational data base and up to eight "windows" for working on separate functions simultaneously.

He explained that Sord was the number two company in Japan in personal computers, after 14 years. The name was invented from the "SO" in "software" and the "RD" in "Hardware". "Because we believe they must all work together," he told me proudly.

I don't know if he understood for whom I was reporting, but he did understand the bright green press ribbon. So he asked if I would like to speak with the president.

"The president of Sord?" I asked.

"Yes," he replied.

We set an appointment for Saturday morning.

When I arrived for the interview, the president was standing at the perimeter demonstrating the machinery. I agreed with my salesman friend to enter the plexiglass booth across the carpet from the products. I'd wait for the president there.

I sat down and set out my Model 100 for note-taking, conscious of the irony. I'd be demonstrating a competitor under the president's very nose.

Takayoshi Shiina entered the cubicle wearing a perfect pinstripe suit and a *Wall Street Journal* necktie. We each bowed slightly and he sat at the table across from me. He was younger than I had expected. My guess was 40.

His English was not as good as his manager's, but after all, his daily work is at Kyobashi K-1 Bldg., 7-12, Yaesu 2-Chome; Chuo-ku, Tokyo, Japan. I told him I had had the pleasure to spend some time in Japan for Avon, and he smiled in a pleasant way. All we were missing was tea.

Meanwhile, outside the doorway, and around the perimeter, people were stopping to watch the two of us — me typing notes into my computer on the table, the two of us like U.N. diplomats in the news.

"How are you finding things in the U.S. so far?" I asked him. A safe beginning.

"The American microcomputer market is about 10 times the size of Japan's," he said. "Now the idea is to make a kind of standardization in the personal computer. IBM standardization makes it easy now. Like riding the surf on the water. Standardization with IBM makes it easy for us. We'd like to combine that with good, unique ideas."

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A point of sales and forms generation program in one! This program will generate personalized purchase orders, sales orders, receipts and invoices. All data can be saved to ram storage. The program is self formatting, eliminating the need for expensive pre-printed business forms, and since it can print consecutive copies, expensive multi-part forms are not needed either. The program even supports sales taxes and discounts and performs all math functions.

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THE WIRE

"The American market is coming up quickly, already 10 percent of the total are getting computers. Now it will grow more quickly from 80 percent to 90 percent. A big growth market."

I decided to take a risk. "You know, don't you, that we read in newspapers here that the Japanese are growing very big in technology?"

He nodded. Perhaps with national pride.

"Well," I continued, "some Americans worry about that. They worry that the Japanese will be too big. That it may not be good. What would you say about that?"

"Ah," he said, "We're not yet in that kind of times. The computer is different than consumer products like the car. The computer needs much explaining on how to use. The Japanese are good at products that are known, but lack the function to explain or service. Even NEC, and others, are still lacking the servicing."

"Sord should take only 2 to 3 percent of the market."

"You'd be happy with that?" I asked. "Why?"

"Yes. The market is already established," he said. "It's difficult to penetrate. I'd be happy in three to five years to have 2 to 3 percent."

"In a seminar today," I said, "people said the Sord desktop computer was very slow. What do you say about that?" (I knew I was talking as distinctly and simply as I could. I was just hoping I wasn't unconsciously being too loud, wanting to be understood within our private, glass cabin.)

"We know it is slow," the president said. "We have already been making it faster. It will be 20 percent faster in the store. Now we are doing beta testings. We have not yet delivered to end users. The final product, 20 percent faster. Not a problem with processing speed. The integration software is very sophisticated. It will be faster. "It is full-bit mapped and eight marked windows. With relational data base. You will learn in 30 minutes."

"You know," I said. "My machine has a built-in modem. Will your machine have a modem?"

"No modem to start," was the answer. "We will introduce one with and one without. Today the excluded one. The included modem in a few months."

"Do people use telecommunications service like The Source in Japan?" I wanted to know.

"Yes, but not popular in Japan. Not yet. Needs improvement."

"What are you most afraid of as you enter the U.S.?" I asked.

"We have failed twice before," he said. "Once, 1975. Again, 1977. We wanted to enter U.S. market but we were too small then. Not enough advertising then."

"Now we're small to medium. \$100 million last year. 8 percent profit. We will spend \$1 million in magazines and newspapers."

He wasn't really, it seemed, implying that it was a big budget, but that this time it should be enough for starters.

He told me he had received many distribution inquiries at Comdex and was very pleased.

"In the seminar I just came from," I said, "the speaker said that the Sord ideas were very good. The speaker liked the programs on your machine."

The president nodded.

"But," I continued, "he said that later this year there will be many full-screen machines, and that Sord could be in trouble then, because you have a small screen. What do you think of that?"

"Trouble later in year? New machines in future? We also have a future! We are prepared, the full size of the screen. Bigger.

"We have 350 engineering people. I don't care about that kind of talking, that Sord will have trouble. We have strong engineers. We can introduce plenty products."

We laughed together at the fact that someone doubted his engineers.

"Tell me," I said. "You know I'm an electronic journalist here. Do you know what a 'scoop' is?"

He nodded yes.

"You do? Well, could you give me a scoop?" I was a bit embarrassed. Everything I had read about being a sensitive American had told me to be careful about asking for "gifts", as I was doing in effect. It isn't nice to ask, since the other is obliged to give.

He delighted me with his answer.

"What kind of scoop would you like?" he asked. He started ticking off the potential "scoops" on the fingers of his hand.

"You tell me — new product? Marketing? Other kind of scoop?"

"A new product," I said. "Give me a new product scoop, if you wouldn't mind."

"A new product," he said. "Next May, we are announcing a product like an IBM 3270 SNA computer. With NAPLPS decoder. With MS-DOS, with UCSDP Operating System. Also concurrent CPM."

I didn't understand it all, but I was impressed anyway. "All in one machine?" I asked.

"Yes! Also Sord real-time, multi-job operating system. Also multi-user Basic. Also Fortran, Cobol. Ascii."

"All in one machine?!" I asked, feeling that this must certainly be a long list of wonders. "Isn't that unusual?"

"Is very good," he said.

He must have realized that I was only dimly comprehending him, because he pulled out of his jacket pocket three pieces of paper. Three information sheets on products. Three separate products.

He handed me one. For the product "scoop" he had given me. "The multi-user 16-bit computer that fits on your desk."

"Don't give details," he said, as he handed me the paper. It was a sacred agreement; but as far as I can tell the paper supports everything he said and more.

"Tell me," I said. This was my last question. "You are talking to America now. What would you like to tell them?"

He savored the question for a moment or two.

"Tell them," he said, "Sord has continuing software and hardware. Never just a computer, just a tool. The computer is like a human. The hardware must be grown. The software must grow. Like the muscle. Like the brain. We will be growing, like the human. Tell them that!"

I loved his answer. He did too.

We bowed. I was glad to be able to say, "O-hay-o-guhzaimos."

He replied in kind.

I had interviewed a gentleman. And I wished him well. ◀

—Mike Greenly

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A LOOK AT HOW THE 100'S MPU EVOLVED IS A STUDY IN MICRO-GENETICS

This month I'll take a look at the "soul" of the 100 — the microprocessor or MPU — and its history. By now you probably already know the chip that drives the 100 is an 80C85. But why this chip? Why not the king of eight-bit microprocessors, the Z-80? Or the more powerful 6809?

If you read my last three columns, you won't be surprised to hear the interrupt-handling capabilities of the 80C85 obviously influenced the designers of the 100. The 80C85 has an interesting family tree which gives insight into why it's in existence and how it successfully can rub shoulders with chips that are traditionally regarded as superior.

HISTORY LESSON. The story goes back to the Dark Ages in microcomputing — 1971. In that year, the Intel Corporation released the great-grandfather of the 80C85, a chip called the 4004.

This was a four-bit microprocessor and a lackluster start to the species. Intel had seen the direction digital electronics was taking (towards programmable, versatile control equipment)

and filled what they correctly saw as a niche in the market. Coupled with the state-of-the-art of integrating many electronic parts onto a silicon chip, the 4004 was an adventurous start.

A four-bit microprocessor is not very powerful. Whereas an eight-bit MPU can handle numbers between zero and 255, four bits can hold only between zero and 15. The 4004, although well-suited to many low-end control applications, was never going to drive any microcomputer worth its salt. It may have been at home driving an "intelligent" record player, but nobody was going to write a CP/M for it.

SHORT-LIVED. Next, Intel designed the 8008. According to my sources, this was designed to Datapoint's specifications. Its mission in life was to provide control for an intelligent data-processing terminal, an important step towards the concept of a computer on a chip. Probably the most important attribute of this chip was its eight-bit architecture.

However, Intel already had other ideas. Advances in large-scale integra-

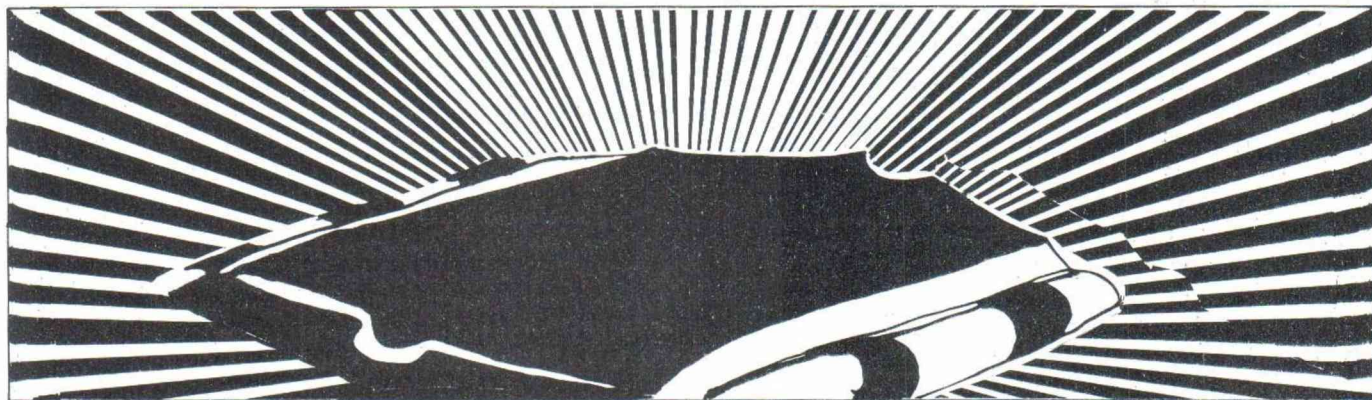
tion (LSI) were allowing for thousands of parts to be etched onto silicon. The days of the 8008 were numbered: the grandfather of the 8085 was to have a short, uneventful life.

According to an autobiographical article in the January 1980 edition of *Dr. Dobbs' Journal*, Gary Kildall was sitting quietly at his desk at Intel when Masatoshi Shima rushed in. It was 1973 and for some time since the introduction of the 8008, Shima had been working on the next Big Thing. In his laboratory was a microscope amid a rat's maze of wires, probes, meters, and oscilloscopes. Under this microscope was a chip of etched silicon which was about to change the face of computing. Kildall peered down at the first *real* eight-bit microprocessor, the 8080.

Shima said, "Let there be eight bits." And there were eight bits. And they were good. So good in fact that within a short time, Motorola was competing with the 6800 which was to evolve in two directions: one leading to the 6502, and one leading to the 6809.

CHIP RACE. Fairchild was in the race with the F-8 (which in 1977 was the world's largest selling microprocessor). At this time, it'd have cost you \$360 to buy an 8080. Within five years the cost had dropped to \$10, and now you can get them for less than \$5.

In the meantime, Gary Kildall, who



had been working on software simulation of the 8080 for Intel's development effort, was working on a disk operating system to support the chip. In 1975, the first commercial licensing of the CP/M disk operating system took place and two years later, CP/M was officially introduced.

The success of the 8080 was assured. So much software has since appeared for this MPU that any manufacturer who designs a microcomputer around it is assured of a readily available assortment of tested software products. Bearing this in mind, it's easy to see what pressures are exerted on the industry to try and stay as compatible as possible with the instruction set of the 8080.

EVOLUTION. The next step led to both the Z-80 and the 8085. Thus a long line of microprocessor development had led to the chip which presently drives the Model 100. Although the Z-80 went on to greater things by vastly expanding the number of available machine-code instructions (but retaining the original 8080 ones), the 8085 was a comparatively humble upgrade.

All the instructions of the 8080 are there, making that huge software base available. Its main enhancements lay in the way it could deal with interrupts from external devices. Thus the only software difference is two extra instructions exist to deal with the handling of interrupts. As all microcomputers have to deal with external devices of some kind, the 8085 offers advantages over the 8080 in the way it talks to the outside world.

This is what makes it so ideal for the 100. The 100 interfaces at the hardware level with modems, serial ports, printers, cassettes, and bar-code readers in its standard configuration.

MISSING LINK. The final twist in the tale of the Model 100 is we have an 80C85 rather than a plain 8085. This refers to the method of manufacture of the chip. The 80C85 is put together using what's known as CMOS technology. This technology produces logic chips which are well-known for their low power consumption.

For a portable, battery-operated microcomputer, it's difficult to see which microprocessor would have been better suited to its task. In the words of Darwin, it's survival of the fittest. All that micro-evolution was for something. ◀

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BUSCH LEAGUE

DAVID BUSCH



LEARN HOW TO CHANGE RAM FILES WITH THIS REMARK REMOVER

This is the second in a series of columns by Dave on constructing a program generator for the Model 100. The columns are based on Dave's The Automatic TRS-80 published by Tab Books.

In the first article of this series, we explored opening a RAM file, reading it in line-by-line, then examining a string of characters in order to count the words in that file. The next step is to alter the file, then write the changed file to RAM. Several of the programs in this series are based on that principle, and the first of these is "REMOVER."

REMOVER. The program will read-in a RAM file like before. However, REMover will print to RAM a new file similar to the old one. The only difference is when the program encounters a remark (REM or '), the remainder of the program line will be truncated. If a line consists only of a line number and a remark, the line will be deleted from the program. The result will be a program with all of the comments removed.

Depending on the number of remarks used in the original program, the remarkless version may be significantly smaller and therefore consume less memory space.

SIMPLE? Ordinarily, one might think clipping remarks from a program would be ridiculously simple. Since the 100 ignores anything after REM or ', a program could simply search for those two strings.

However, what about remarks within print statements? You wouldn't want

REM and ' removed in those instances. REMover takes care of this stipulation by simply looking at each program line for quotation marks as well as remarks. If a REM appears after one quote, but before the second, then it's contained within quotation marks. This assumes the programmer hasn't mismatched quotes and has included two for every prompt.

REMOVING REMARKS. The program begins by asking the operator for the name of the program which will have its remarks removed. This name, F\$, is used to form the name of the output file automatically.

First, in line 100, the second name, F1\$, is formed by taking its first four letters and adding RM.DO to them.

Next, both files are opened, and a single line is input in line 140. Variable P, where the search for REMs begins, is set to one. Thus, the initial search for remarks will begin at the first character of A\$.

TANDEM SEARCH. Because both REM and ' can indicate remarks, two searches must be conducted. First, in line 160, the program checks for ', and, if it's found, assigns variable R with the position of the suspected remark. Control then branches to line 200.

If no apostrophe is located, the program next checks for REM, in line 180. If no remark is found, then the program line is already remark-free, and the program branches to line 350.

Possible remark lines are examined further at a routine beginning at line 200. There, Q1 is assigned the value of the position of a quote mark. If none is

found, then a remark has indeed been located and the control passes to line 260. If a quote is detected, then REMover looks at the rest of the program line, beginning at position Q1+1 for a second quote. That value is Q2. If the position of the remark, R, is less than Q1 (the remark appears before the first quote), or is more than Q2 (it appears after the second quote), then a remark is verified, and the program goes to line 260.

REMARK VALIDITY. If neither condition is true, then the alleged remark is actually within the quotes, and is disqualified. The program instead makes P equal to the next position after the second quote (Q2+1), and returns control to line 160 to see if possible remarks exist after position P. In this way, an entire, multi-statement line can be looked at section-by-section to detect all remarks.

When a valid remark is located, the program takes all of the program lines up to the remark itself, using A\$=(LEFT\$,R-1), as in line 260. This, in effect, truncates the program at the remark.

We aren't through yet. After all, some program lines consist of just a line number and a remark. Cutting off the remark leaves only the line number. This is a bit untidy, and also a waste of computer memory. So, the program cycles through a For-Next loop from 1 to the length of A\$. Each time through, the string variable B\$ is assigned the value of the middle character at position N.

CHARACTER CHECK. This character is scrutinized to see that it's a number in the range 0-9, since all program lines begin with numbers. As soon as B\$ doesn't equal a number, REMover knows the line number is over, and control drops down to line 310.



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Left to Right: Prairie Power 5.5, 2.6, 8.
Front to Back: Tandy Model 100, Olivetti M10, NEC 8201A.

There, T\$ is assigned the rest of A\$. If T\$ is empty, or consists only of a space, then the program knows it has found an empty program line, and loops back to line 130 without printing anything to the RAM. That line has been deleted from the program entirely.

If T\$ does have characters, a check is made to see if the final character is a

colon, as would be the case if a remark followed a colon on a multi-statement line:

```
10 PRINT "HELLO":REM This is a remark.
```

If a colon is the last character, it's deleted in line 340. Then, A\$ is printed to the screen (so the operator can monitor

the progress of the program) and printed to RAM. Control goes back to line 130, where a check for the end-of-file is made, and another program line input from the RAM.

THAT'S IT. And if you'll excuse the pun, that's all there is to REMoving the REMarks from your programs. ◀

```
10 ' * REMover *
20 ' *****
60 CLEAR 5000
   : MAX FILES =2
65 ' *** Enter filename ***
70 CLS
   : PRINT
   : PRINT
80 PRINT "Enter name of program to"
81 PRINT "remove remarks from.";
90 LINE INPUT F$
100 F1$=LEFT$(F$,4)+"RM.DO"
110 OPEN F$ FOR INPUT AS 1
120 OPEN F1$ FOR OUTPUT AS 2
130 IF EOF(1)GOTO 380
135 ' *** Load Program Line ***
140 LINE INPUT #1,A$
150 P=1
155 ' *** Check for REMARKS ***
160 R=INSTR(P,A$,"")
170 IF R<>0GOTO 200
180 R=INSTR(P,A$,"REM")
190 IF R=0GOTO 350
195 ' *** Find Quotes, if Any ***
200 Q1=INSTR(P,A$,CHR$(34))
   : IF Q1=0GOTO 260
210 Q1=Q1+1
```

```
220 Q2=INSTR(Q1,A$,CHR$(34))
230 IF R<Q1 OR R>Q2GOTO 260
240 P=Q2+1
250 GOTO 160
255 ' *** Strip off REMARKS ***
260 A$=LEFT$(A$,R-1)
270 FOR N=1 TO LEN(A$)
280 B$=MID$(A$,N,1)
290 IF ASC(B$)<48 OR ASC(B$)>57GOTO
   310
300 NEXT N
310 T$=MID$(A$,N)
320 IF T$="GOTO 130
330 IF T$="GOTO 130
340 IF RIGHT$(A$,1)="/" THEN A$=
   LEFT$(A$,LEN(A$)-1)
345 ' *** If line not empty, print to
   RAM ***
350 PRINT A$
360 PRINT #2,A$
370 GOTO 130
380 CLOSE
385 ' *** Again? ***
390 PRINT
   : PRINT
400 PRINT "Process another file?"
410 PRINT "(Y/N)"
```

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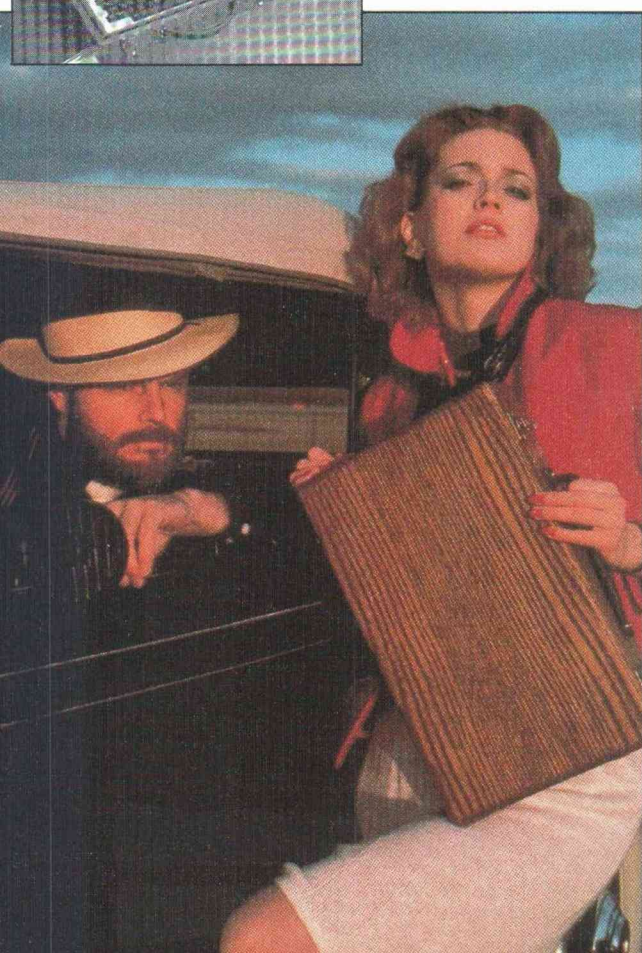
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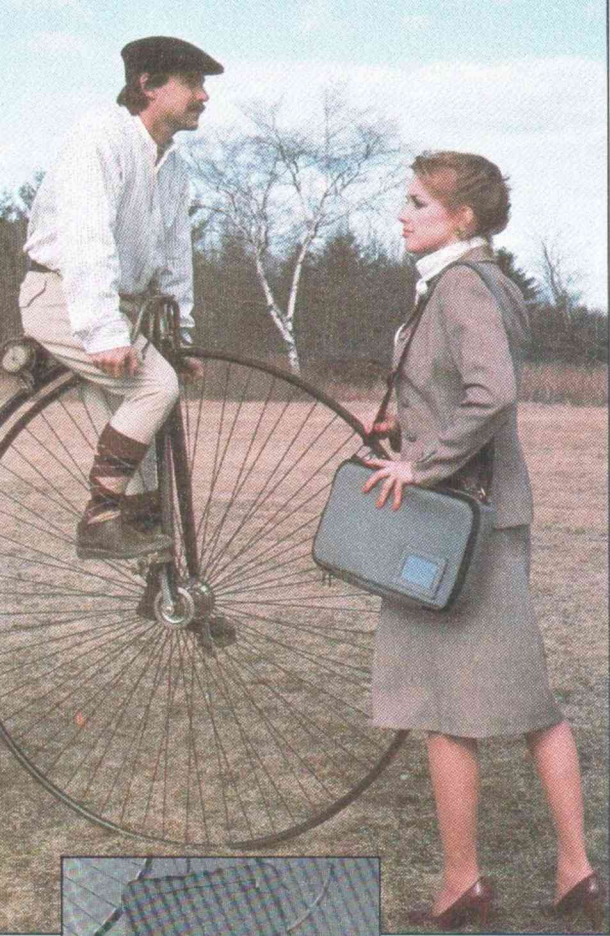


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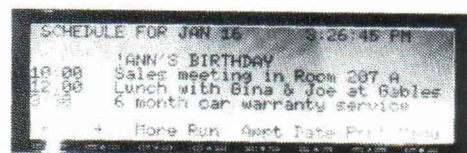
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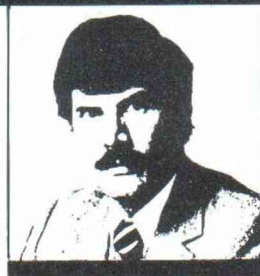
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TIP OF ICEBERG. But the CompuServe Information Service is only the beginning; hundreds of other specialized data bases also exist. Of the data bases available, some are full-text search, others are keyword search, and a few are still only text files. But the list hopefully will provide insight into the quantity and breadth of electronic information available.

Full-text search data bases generally are the more powerful since you can search an article directly for any word or phrase specified. However, learning the specific commands to accomplish your search generally means learning a complex searching language. Data bases using a keyword searching method only allow you to search for words that the data base provider determines.

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AVAILABLE DATA BASES. Below is a collection of data bases currently available. It's not a complete list by any measure, but it does show the wealth of commercial information that exists.

Many of the data bases cataloged below may be on more than one data base-provider company so it may be worthwhile to compare pricing and features.

AMMSI Communication Network. *Source Telecomputing Corporation.* Covers information on the use of the computer and information systems in medicine. This data base includes citations relevant to literature, vendor information, and a calendar of events. Produced by the American Association for Medical Systems and Informatics (AAMSI), membership in AAMSI is required.

ABI/Inform. *BRS, Dialog, and ITT Dialcom.* ABI/Inform contains citations, with abstracts, to the worldwide periodical literature on business and management. It covers accounting, economics, financial management, law and taxation, marketing, labor relations, and other business areas. Produced by Data Couries Inc.

Academic American Encyclopedia. *BRS, Dialog, Dow Jones.* The Academic American Encyclopedia contains full-text search of the 20-volume encyclopedia. On CompuServe, this data base is searchable by keywords only; on BRS and Dialog, it is a full-text search data base.

Accident/Incident Data System. *United Information Services Inc.* Information on general aviation accidents and incidents is provided. This data base includes date, type, investigating agency, location, aircraft involved, public inquiries, fatalities, etc. and is produced by the Federal Aviation Administration, Flight Standards Field Office.

AGRICOLA. *BRS and Dialog.* Citations to the worldwide agricultural literature, covering agricultural economics and rural sociology, agricultural production, animal sciences, food and human nutrition, natural resources, and soils and fertilizers. Produced by the U.S. Department of Agriculture.

AgriStar. *AgriStar(tm).* AgriStar contains many files of agricultural business information, including commodity news, cotton trade news, market news, weather reports and forecasts, market analyses and advisory reports, up-to-the-minute news stories that are influencing commodities markets, and graphs of current and historical commodities market data. Produced by AgriData Resources Inc. and others.

Altman Weil Report to Legal Management. *NewsNet Inc.* Full-text search of the monthly Altman Weil Report to Legal Management. It provides descriptive and evaluative information on services and products used in law offices and tracks trends. Produced by Altman Weil Publications Inc.

AM Best Insurance Data Base. *Chase Econometrics/Interactive Data.* Financial data on U.S. insurance companies, including life, health, accident, and property and casualty companies. Produced by A.M. Best Company (subscription required).

ASI (American Statistics Index). *Dialog.* Citations, with abstracts, to U.S. government publications containing social, economic, demographic, and other statistical data. Produced by Congressional Information Service Inc.

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CIS/Index (R). *Dialog.* Citations,

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Executive Productivity. *NewsNet.* Full-text search of Executive Productivity, a monthly newsletter in the area of performance and personal effectiveness of executive personnel. Produced by Newsletter Management Corporation.

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International Software Data Base. *Dialog and Knowledge Index.* Full-text search of commercially available software for all types of microcomputers and minicomputers. The International Software data base includes a description of the software, hardware, and operating system requirements, distribution medium, price, and supplier's name and address. The data base is the largest and most comprehensive detailed information on software in the world. In addition, the software can be ordered while on line. Produced by The Menu: The International Software Data Base.

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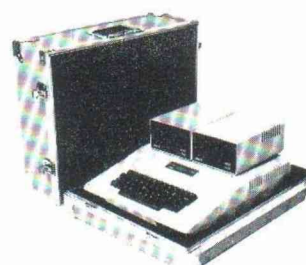
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REL(R) (Real Estate Listing Service). *The Source.* Data base of real estate and resort property available for sale. RELS includes resort timeshares, resort condominiums, and hotels and motels. Produced by MDR Telecom (subscription required).

Site II (R) and Site.Potential. *Chase Econometric/Interactive Data, CompuServe, United Information Services Inc.* A demographic retrieval generation system based on the 1960, 1970, and 1980 census of population and housing. Site II also includes annual income estimates, zip code area data, and demographic information. Produced by CACI Inc.

Two/Sixteen Magazine. *NewsNet.* Full-text search of the *Two/Sixteen* magazine, providing hardware and software information for users of the TRS-80 Models II, 12, and 16 microcomputers manufactured by Radio Shack. Produced by *Two/Sixteen Magazine.*

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CREATE A DATA BASE WITH RADIO SHACK'S DISK-VIDEO INTERFACE

Spreadsheets, spreadsheets — anyone got a spreadsheet? You bet. *Spectaculator* should fit your bill nicely. Shipped out over a month ago, it ought to be in computer centers and expanded computer departments by now.

Spectaculator (catalog number 26-3828) sells for \$49.95 and is a tape-based spreadsheet program. It's written entirely in machine language and is fast. Also, it includes a help file which can be deleted to save valuable RAM space.

Stop by and take a look if you need a nice spreadsheet. Oh yes, it requires a Model 100 with 16K memory as a minimum.

MEA CULPA. I want to state unequivocally that I'm not now, nor shall I ever be, a programmer.

I don't have the patience necessary to thoroughly work through a solution to find the best algorithm.

I'm not enamored by a bubble, ripple, or shell-metzner sort.

I don't spend my waking hours in pursuit of the perfect display or input routine.

The line numbers in my programs may not be evenly spaced, the output may be ragged looking, but by damn, the program does the job I want it to do.

What I'm trying to say is that I program to get things done.

There. I've said it and I'm glad. Anybody else out there care to confess? Like the priest in the movies always said, "Confession is good for the soul."

MAKING RAM ROOM. Several people have written in and asked for more information on the Disk-Video Interface. Specifically, they want to know why it

doesn't provide the capability of random record access and what, if anything, can be done about it.

Well, the reason the disk drive unit doesn't have random record access is the 100 itself doesn't support random access to the RAM files.

The reason for that is buried inside the main read-only-memory (ROM) that contains all the internal software. We ran out of room and random access was tossed out as being too expansive in terms of code required to support it. So much for internal RAM files; how about the disk?

True random access is out as well, but with two commands added to the disk system, you can have pseudo-random access. You'll have to be a tidy programmer and keep up with all the housekeeping chores yourself, but it can be done.

HOUSEKEEPING. The Disk-Video Interface has a 39-track, double-density, single-sided drive. Each track consists of 18 sectors, with 256 bytes each (figure 1). Therefore, multiplying 40 by 18 by 256 equals 184,320 bytes per disk. With a full system disk, part of this storage area is taken up with necessary housekeeping information.

The first two tracks are entirely taken by the operating software for the Disk-Video Interface, as well as the Disk Basic loaded into the 100.

Track 20 is called the directory track and it contains information necessary for the 100 to be able to find and manipulate any file on the disk.

So, on a full system disk, 13,824 bytes are reserved leaving 170,456 bytes for your use.

It isn't necessary for you to keep a

system disk in the drive once the unit has been connected to an operational 100, since all the software is loaded already into the interface as well as the 100. This lets us use all 184,320 bytes, but the penalty paid is we must keep track of what goes where on the disk. But how? Via `DSKI$` and `DSKO$`.

ENTER DSKI\$. These two commands stand for Disk Input and Disk Output and do just that. They cause data to be input from and output to the disk drive at any specified spot on the disk.

The syntax of these commands is:

- `DSKO$` drive number, track number, sector number, which sector half, expression; and
- `DSKI$` (drive number, track number, sector number, which sector half);

So, if I want to write the word hello to the first 128 bytes of sector 13 on track 9 in drive 1, the command will look like this:

`DSKO$ 1,9,13,0,"HELLO"`

The entire 128 bytes allocated to the first half of sector 13 will be written. The first five bytes will be "HELLO" and the remaining 123 bytes will be null characters (decimal value of zero, not decimal zero). If I want to read it back, the command is:

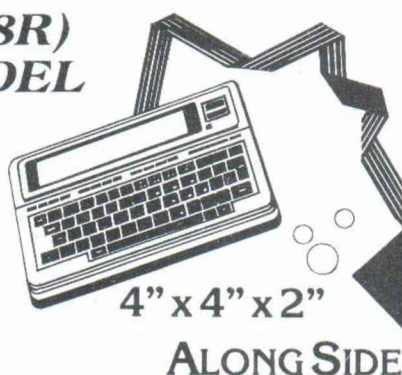
`PRINT DSKI$ (1,9,13,0)`

FANCY FINANCING. Since we don't need anything but a formatted disk in the drive, let's take advantage of that to simplify the example this month, and next month we'll make it a little more complicated.

Joe wants to organize his finances. His first priority is to put all of his checks by number into a central filing system. Since Joe has his new 100 with a Disk-Video Interface, he's decided to use that. He decides he needs the following information about each check:

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This bubble memory module has a non-volatile memory which means the memory will not be lost in the event of loss of power

or dead batteries. It can operate like a hard disk in which vast amounts of data or programs may be quickly stored, downloaded, and then run in the Model 100's 32k RAM. Upon downloading to RAM, the data is not erased from the bubble memory. With the use of simple sub-routines, programs which exceed the Model 100's RAM may be made to operate by sampling between the 100 and the bubble. No more I/O errors or cassettes or disks that won't read, and no more address or note files which take up the majority of RAM preventing the storage of other programs and requiring tedious cassette or disk procedures.

Power consumption is low because the bubble memory is powered up only when it "reads" or "writes" and it performs these functions in less than a second.

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Stevie Wonder's Model 100, this module is especially useful to reporters, programmers needing remote terminals, or anyone finding that they need more memory in order to take full advantage of their investment in the Model 100 and all the software they may have bought but cannot use due to lack of memory.

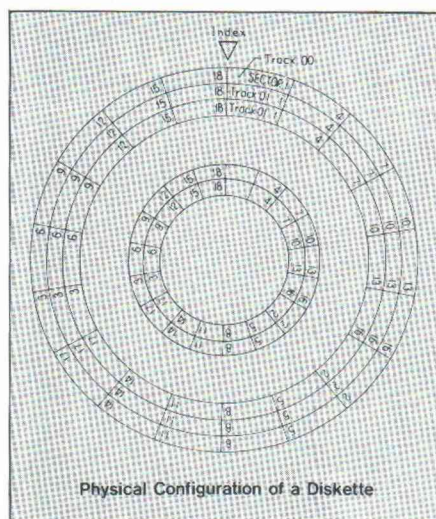
The two models differ in price and features. The Model 128R sells for \$750.00, while the bottom attachment — Model 128X, sells for \$950.00. The 128X series allows space for the interfacing of additional 128k memory modules and their power requirements.

As certain programming is necessary for operation of the bubble memory module with the Model 100, the software driver sells for \$100.00.

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Joe programs like me — for results, not aesthetics. He decides he can keep each check's information in 128 bytes so he can store two checks in each sector on the disk. Since he's dedicating a disk, the maximum number of checks the system is capable of handling is 1440 (2 sectors x 18 sectors x 40 tracks). This is adequate for a full year since he writes about 65 to 70 checks per month.

GET ON TRACK. The first task is to figure out how, using a check number, to position the disk drive head to the proper track and sector (including which half of the sector) for each read or write operation. He makes up a chart showing the highest check number stored in a given sector on a specific track (table 1).

The first or second half of each sector he finds can be found by the formula:

$$(\text{Check Number} + 1) \text{ MOD } 2$$

Finding the right track number stumps

him for a while, but he gets it with:

$$((\text{Check number} - 1) \div 2) \div 18$$

(Note that integer division has been used since whole numbers are the object of this search.)

The exact sector was pretty elusive too, but through trial and error he came up with:

$$(\text{Check number} - (\text{Track Number} \times 36)) \div 2$$

He verified these by writing a small program to check the values against the table. Use the listing shown to check Joe's work (program listing 1). Was he right?

THE CYCLE. Once he figured out that, all remaining was to write a simple routine allowing him to enter information and then store it properly on the disk

Table 1.

Track	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
1	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72
2	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108
3	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138	140	142	144
4	146	148	150	152	154	156	158	160	162	164	166	168	170	172	174	176	178	180
5	182	184	186	188	190	192	194	196	198	200	202	204	206	208	210	212	214	216
6	218	220	222	224	226	228	230	232	234	236	238	240	242	244	246	248	250	252
7	254	256	258	260	262	264	266	268	270	272	274	276	278	280	282	284	286	288
8	290	292	294	296	298	300	302	304	306	308	310	312	314	316	318	320	322	324
9	326	328	330	332	334	336	338	340	342	344	346	348	350	352	354	356	358	360
10	362	364	366	368	370	372	374	376	378	380	382	384	386	388	390	392	394	396
11	398	400	402	404	406	408	410	412	414	416	418	420	422	424	426	428	430	432
12	434	436	438	440	442	444	446	448	450	452	454	456	458	460	462	464	466	468
13	470	472	474	476	478	480	482	484	486	488	490	492	494	496	498	500	502	504
14	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540
15	542	544	546	548	550	552	554	556	558	560	562	564	566	568	570	572	574	576
16	578	580	582	584	586	588	590	592	594	596	598	600	602	604	606	608	610	612
17	614	616	618	620	622	624	626	628	630	632	634	636	638	640	642	644	646	648
18	650	652	654	656	658	660	662	664	666	668	670	672	674	676	678	680	682	684
19	686	688	690	692	694	696	698	700	702	704	706	708	710	712	714	716	718	720
20	722	724	726	728	730	732	734	736	738	740	742	744	746	748	750	752	754	756
21	758	760	762	764	766	768	770	772	774	776	778	780	782	784	786	788	790	792
22	794	796	798	800	802	804	806	808	810	812	814	816	818	820	822	824	826	828
23	830	832	834	836	838	840	842	844	846	848	850	852	854	856	858	860	862	864
24	866	868	870	872	874	876	878	880	882	884	886	888	890	892	894	896	898	900
25	902	904	906	908	910	912	914	916	918	920	922	924	926	928	930	932	934	936
26	938	940	942	944	946	948	950	952	954	956	958	960	962	964	966	968	970	972
27	974	976	978	980	982	984	986	988	990	992	994	996	998	1000	1002	1004	1006	1008
28	1010	1012	1014	1016	1018	1020	1022	1024	1026	1028	1030	1032	1034	1036	1038	1040	1042	1044
29	1046	1048	1050	1052	1054	1056	1058	1060	1062	1064	1066	1068	1070	1072	1074	1076	1078	1080
30	1082	1084	1086	1088	1090	1092	1094	1096	1098	1100	1102	1104	1106	1108	1110	1112	1114	1116
31	1118	1120	1122	1124	1126	1128	1130	1132	1134	1136	1138	1140	1142	1144	1146	1148	1150	1152
32	1154	1156	1158	1160	1162	1164	1166	1168	1170	1172	1174	1176	1178	1180	1182	1184	1186	1188
33	1190	1192	1194	1196	1198	1200	1202	1204	1206	1208	1210	1212	1214	1216	1218	1220	1222	1224
34	1226	1228	1230	1232	1234	1236	1238	1240	1242	1244	1246	1248	1250	1252	1254	1256	1258	1260
35	1262	1264	1266	1268	1270	1272	1274	1276	1278	1280	1282	1284	1286	1288	1290	1292	1294	1296
36	1298	1300	1302	1304	1306	1308	1310	1312	1314	1316	1318	1320	1322	1324	1326	1328	1330	1332
37	1334	1336	1338	1340	1342	1344	1346	1348	1350	1352	1354	1356	1358	1360	1362	1364	1366	1368
38	1370	1372	1374	1376	1378	1380	1382	1384	1386	1388	1390	1392	1394	1396	1398	1400	1402	1404
39	1406	1408	1410	1412	1414	1416	1418	1420	1422	1424	1426	1428	1430	1432	1434	1436	1438	1440
40	1442	1444	1446	1448	1450	1452	1454	1456	1458	1460	1462	1464	1466	1468	1470	1472	1474	1476

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(listing 2).

So, how does it all work? Very simply, of course.

The input program collects a check's date, to whom it's written, what for, the amount, and if it is deductible or not.

Lines 300 – 350 use the check number to position the data onto a track and sector of the disk.

Lines 400 – 460 place the data into a single string of 128 characters, and line 470 places this string onto the disk. Then it begins all over again.

REVERSE. Recalling the information (listing 3) is pretty much a reverse of the input process from a programming standpoint.

Lines 200 – 230 get a check number and verify that it's within bounds of 0 to 1440.

Lines 300 – 350 determine which track and sector the information is on, and 360 gets the information from the disk into a string named Z\$.

450 – 460 check to see if there is any information in this record. If so, it dis-

plays it and waits for an enter before returning to the beginning. Otherwise, it displays an error message and asks for another check number.

STAY TUNED. The more Joe looked at the program, the more he was convinced that it must be improved. After all, how was he going to get a listing of all checks stored in sequential order? A listing of checks by date order?

Keep watch next month as Joe learns some new tricks. ◀

Listing 1.

```
1 ' Validate Track/Sector of Disk
2 ' based on 128 byte records
3 ' 3/11/84
4 ' by Bill Walters and Joe Example
5
10 INPUT "record";A
20 TN=((A-1)\2)\18
30 PRINT "Track Number = ";TN
40 SN=((A-(TN*36))+1)\2
50 PRINT "Sector Number = ";SN
60 H=(A+1) MOD 2
70 PRINT "Sector Half = ";H
80 GOTO 10
```

Listing 2.

```
10 ' Check Database
20 ' 3/11/84
30 ' by Bill Walters
40 ' and Joe Example
50 '
```

```
60 CLS
: CLEAR 512
70 PRINT "Data Loader"
80 PRINT
: PRINT "Saves Check Information
to Disk"
90 PRINT
: PRINT "Insert CHECKS data disk"
100 INPUT "Press ENTER when ready";A
200 CLS
210 INPUT "Check Number (0 to quit) ";
N
215 IF N=0 THEN MENU
216 IF N<1 OR N>1440 THEN 210
220 INPUT "Date Written (MM/DD/YY) ";
D$
230 INPUT "Written To ";PS
240 INPUT "Written For ";F$
250 INPUT "Amount ";A$
260 INPUT "Deductable (Y/N) ";T$
```

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```

270 INPUT "All OK? (Y/N) ";O$
280 IF O$="Y" OR O$="y" THEN 300
    ELSE 200
300 ' Track number
310 TN=((N-1)\2)\18
320 ' Sector number
330 SN
    : N=((N-(TN*36))+1)\2
340 ' Which half of the sector
350 SW=(N+1) MOD 2
400 ' Write it all out
410 Z$=SPACE$(128)
420 MID$(Z$,1,8)=D$
430 MID$(Z$,9,40)=P$
440 MID$(Z$,50,60)=F$
450 MID$(Z$,111,17)=A$
460 MID$(Z$,128,1)=T$
470 DSKO$ O,TN,SN,SW,Z$
480 GOTO 200

```

Listing 3.

```

10 ' Check Data Recall
20 ' 3/11/84
30 ' by Bill Walters
40 ' and Joe Example
100 CLEAR 1024
110 CLS
120 PRINT "Check Data Recall"
130 PRINT
    : PRINT "Insert CHECK data disk
    in drive"
140 PRINT

```

```

: INPUT "Press ENTER to continue
";A
200 CLS
210 INPUT "Which Check Number (0 to
quit) ";N
220 IF N=0 THEN MENU
230 IF N>1440 OR N<0 THEN 200
300 ' Track number
310 TN=((N-1)\2)\18
320 ' Sector number
330 SN=((N-(TN*36))+1)\2
340 ' Which half of the sector
350 SW=(N+1) MOD 2
360 Z$=DSKIS (O,TN,SN,SW)
400 D$=MID$(Z$,1,8)
410 P$=MID$(Z$,9,41)
420 F$=MID$(Z$,50,61)
430 A$=MID$(Z$,111,17)
440 T$=MID$(Z$,128,1)
450 L=INSTR(1,A$,"$")
460 IF L THEN A$=MID$(A$,L+1,
LEN(A$)-L)
500 CLS
510 IF ASC(D$)>96 THEN PRINT "Record
not on file"
: FOR X=1 TO 500
: NEXT X
: GOTO 200
520 PRINT @40,"Check: ";N;
530 PRINT @65,"Date : ";D$
540 PRINT @80,"Amount: "USING "$$##,
###,##";VAL(A$)
550 PRINT @120,"Pay: ";
560 PRINT @160,P$;
570 PRINT @240,F$;
580 PRINT @315,"";
590 INPUT " ";A
600 GOTO 200

```

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By RONALD F. BALONIS

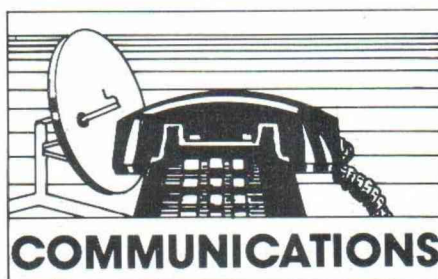
The 100 will dial your phone for you. Radio Shack has a method shown in the manual, pages 82 to 84. Briefly stated, you use TELCOM with the function keys: dial a manually entered telephone number or one from the ADRS.DO file. This novelty works and is great for TELCOM. But, for regular dialing, it's easier to do it yourself. I figured there's got to be a better way.

DID IT MY WAY. Since the 100 has the telephone hardware built-in, all that's needed to make it into a good, useful telephone dialer is a software program. And that's what my Model 100 Dialer program (program listing 1) is for. It's not too fancy, no bells or whistles, just a beep or two. But it's simple to use, as simple as an electronic rotary index file.

Just move the cursor to the name and number and press enter: it remembers and dials the numbers; you do the rest.

WHAT'S THE IDEA? Most dialers are simple to use, but none's as simple as a rotary telephone index file. With a rotary index file for a model, the program that emulates the file must be simple to use too. The utility of programs, even frequently used ones, goes down as the number of commands and instructions go up.

The algorithm of a rotary index file is short and simple: Move through a sorted list of names and numbers, and



when the one wanted is found, dial it. But this isn't as simple to do in software: simplicity of operation can create a rather large software overhead.

To make it simpler, keyboard input is limited to cursor and number keys. To save memory and to make saves and loads easy a data-statement file is used for the number directory: Basic's Edit function is used to maintain it. The number of names and telephone numbers in the directory is limited only by the amount of memory in your machine.

They can be in any order; the file is sorted on initialization. And random access to the data-statement file lets you step the cursor through this sorted directory file.

EASY TO USE. The dialer program requires a short initialization time. When the top of the directory appears, use the cursor control keys (up and down arrows) to step to the number you want, then press enter to dial it. Press shift and the cursor keys to step seven at a time.

To dial a number not in the directory, move the cursor to the upper left hand corner of the screen, and hit enter. When done, press F8 to return to the operating system (Menu). From there, you can maintain the directory by adding or deleting entries with the Basic Edit function.

Each entry is limited to a total of 28 characters, either alphabetic or numeric; each is one program line and one data statement at the end of the program.

DIAL-A-LOG. Following the program listing, the mainline is from line 0 to 510, with initialization from lines 0 to 150. First you POKE in the small machine-language program to dial the number. It dials the numbers by calling two of the ROM's routines: GETHL (23267D) puts the number's location in the HL register and DIAL (21293D) dials the number pointed to by the HL register. A number is dialed by CALL 62950,0,VARPTR(NUMBER\$).

Next the screen is labeled and the directory data file is read, counted, and the memory address of each is located. At the out of data error, the program jumps to the Shell Sort.

The command interpreter routine is from lines 200 to 510. Number the keys and cursor for a cursor location at the upper left of the screen; cursor only for finding a number in the list.

DIAL-AWAY. From lines 1000 to 8050, you have the subroutines that make the program:

- Dial the number, lines 1000 to 1330;
- Dial the number the cursor's on, passing this number (in 10 and A\$) to the machine-language program for dialing;
- Via Shell Sort, lines 4000 to 4110, the directory data file is sorted and only the memory pointers in ADDR5 array are exchanged;
- Move the cursor, lines 5000 to 5080, and erase the old cursor, printing the new one;
- Make the screen and cursor, lines 6000 to 6100, print seven names and numbers from the data directory on the screen; make the cursor a reverse line on the screen;
- Get a name and number, lines 7000 to 7030, from the routine for random access of the directory file; POKE the address of data statement 10 into the active data location, putting it in A\$

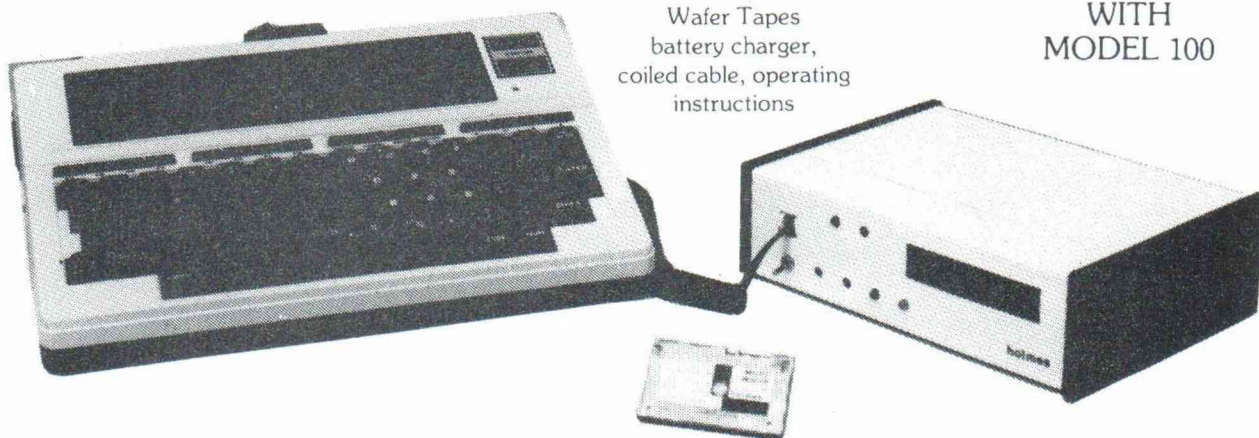
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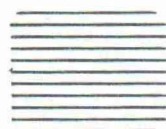
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with a DATA READ;

- Create a software INKEY\$ function, lines 8000 to 8050; a subroutine making an INKEY-type function with a blinking cursor in software; it returns the character in KB\$;
- Store telephone names and num-

bers, beginning at line 10000, each in a single program line and data statement, 28 bytes long.

NUMBER, PLEASE. You're not there yet. To run this program you need to use Radio Shack's telephone interface

```

0 ' DIALER.BA 1/15/84 -- RON BALONIS
5 ' MODEL 100 TELEPHONE DIALER
10 CLEAR 100,MAX RAM-10
   : 'RESERVE MEMORY
15 DEFINT A,F,I,J,M,N,S
20 DIM ADDR(20,2)
   : 'ADDRS OF TEL NUMBERS
25 NOS=0
   : ICUR=1
   : START=1
   : 'INITIAL VALUES
30 RVID$=CHR$(27)+"p"
   : NVID$=CHR$(27)+"q"
35 'TO DIAL A # CALL 62950 WITH # IN
   HL
40 DATA 205,227, 90
   : 'CALL GETHL <5AE3H>
45 DATA 205, 45, 83
   : 'CALL DIAL <532DH>
50 DATA 201
   : 'RETURN
60 'POKE THE DIAL ROUTINE
65 FOR L=62950 TO 62956
70 READ A
   : POKE L,A
75 NEXT L
80 '--- PRESS F8 TO GO TO MENU
85 KEY (8)ON
   : ON KEY GOSUB ,,,,,,9000
90 ON ERROR GOTO 4000
   : 'NOS = DATA ERROR
95 '---MAKE DIALER SCREEN
100 CLS
   : PRINT @13,"++NAME++
   ++NUMBER++"
105 PRINT @80," MODEL 100 "
110 PRINT @120," DIALER "
115 PRINT @200," PRESS "
120 PRINT @240," <↓↑> "
125 PRINT @280," <ENTER> ";
130 NOS=NOS+1
   : '---READ DATA FILE ADDR$
135 '---DATA ADDRESS=64440+
140 ADDR(NOS,1)=PEEK(64440)
145 ADDR(NOS,2)=PEEK(64441)
150 READ A$
   : GOTO 130
190 '---COMMAND INTERPETER
200 POKE 65450,0
   : 'KILL KEYBRD ROLL OVER
205 GOSUB 8000
   : IF KB$="" THEN 200
210 IF KB$=CHR$(31) THEN 285
   : 'DOWN

```


cable (catalog number 26-1410). The program, as listed, uses about 4.3K RAM, and runs in an 8K machine. If you remove the pretty print spacing and remarks, you can reduce it to 3.2K making the program run a lot faster.

Each entry to the directory uses 29

bytes, not including those of the basic line number and data token. Be sure to format each as in the program, otherwise the screen will not format properly. Finally, redimension the ADDR array in line 20 to the number of numbers in your list. ◀

```

215 JF KB$=CHR$(20) THEN 400
    : 'FAST DOWN
220 IF KB$=CHR$(30) THEN 290
    : 'UP
225 IF KB$=CHR$(2) THEN 440
    : 'FAST UP
230 IF KB$=CHR$(13) THEN GOSUB 1000
235 IF ICUR>0 THEN 200
    : 'CURSOR ONLY
240 IF KB$=BKUP$ THEN 245
    ELSE 265
245 IF LEN(A$)>0 THEN 250
    ELSE 265
250 PRINT KB$;" ";KB$;
255 A$=MID$(A$,1,LEN(A$)-1)
260 GOTO 200
265 IF KB$<"0" OR KB$>"9" THEN 200
270 IF LEN(A$)=11 THEN 200
275 A$=A$+KB$
    : PRINT KB$;
    : GOTO 200
280 '---MOVE THE CURSOR
285 ICUR=ICUR+2
    : '---DOWN
290 ICUR=ICUR-1
    : '---UP
295 IF ICUR<START THEN 400
    : ' NEW SCREEN
300 IF ICUR>FINSH THEN 440' NEW SCREEN
305 '---GO MOVE THE CURSOR
310 GOSUB 5000
    : GOTO 200
315 '---CURSOR AT TOP - NEW SCREEN??
400 IF ICUR>0 THEN 420
405 GOSUB 6000
410 PRINT @0,RVID$;SPACES$(12);
415 PRINT @0,"";
420 IF START=1 THEN ICUR=0
    : GOTO 200
425 START=START-7
    : GOTO 500
430 '---CURSOR AT BOTTOM - NEW
    SCREEN??
440 IF FINSH=NOS THEN ICUR=NOS
    : GOTO 200
445 START=START+7
500 ICUR=START
510 GOSUB 6000
    : GOTO 200
900
1000 '---DIAL THE NUMBER
1100 IF ICUR=0 THEN 1300
1110 IO=ICUR
    : GOSUB 7000

```



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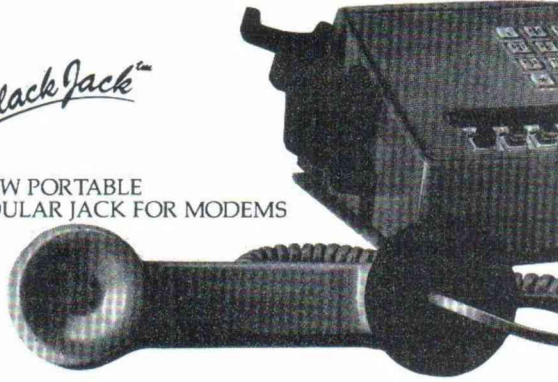
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DIALER

```

: 'GET A$
1200 '---DIAL THE NUMBER IN A$
1300 BEEP
: PRINT @0,RVID$;SPACES(12);
1310 A$=A$+CHR$(0)
: PRINT @0,"";
1320 CALL 62950,0,VARPTR(A$)
: '-DIAL IT
1330 BEEP
: BEEP
: RETURN
1340 '
4000 '---DO A SHELL TYPE SORT OF #S
4005 NOS=NOS-1
: MID=NOS
4010 MID=INT(MID/2)
: 'CUT LIST IN HALF
4015 IF MID<=0 THEN RESUME 500
4020 FOR J=1 TO NOS-MID
: 'DO A PASS
4030 IJ=J
4035 IM=IJ+MID
4040 IO=IJ
: GOSUB 7000
: B$=A$
: 'GET B$
4050 IO=IM
: GOSUB 7000
: '
: GET A$
4060 IF A$>B$ THEN 4100
: ' NO SWAP
4065 I1=ADDR(IJ,1)
: I2=ADDR(IJ,2)
4070 ADDR(IJ,1)=ADDR(IM,1)
4075 ADDR(IJ,2)=ADDR(IM,2)
4080 ADDR(IM,1)=I1
: ADDR(IM,2)=I2
4085 IJ=IJ-MID
4090 IF IJ>=1 THEN 4035
4100 NEXT J
4110 GOTO 4010
: 'GO FOR ANOTHER PASS
4500 '
5000 '---MOVE THE CURSOR
5010 PRINT @0,NVID$;SPACES(12);
5020 IO=II
: GOSUB 7000
: '--ERASE OLD
5030 PRINT @IKUR,A$;
5040 IF ICUR>II THEN II=II+1
: IKUR=IKUR+40
5050 IF ICUR<II THEN II=II-1
: IKUR=IKUR-40
5060 IO=II
: GOSUB 7000
: '--MAKE NEW
5070 PRINT @IKUR,RVID$;A$;NVID$;
5080 PRINT @0,"";
: RETURN
5900 '
6000 '---MAKE A SCREEN AND CURSOR
6005 PRINT @0,NVID$;SPACES(12);
6010 FINSH=START+6
: CUR=51

```



```

6015 IF FINSH>NOS THEN FINSH=NOS
6020 FOR I=START TO FINSH
6030 IO=I
      : GOSUB 7000
      : 'GET A NAME & #
6035 IF ICUR=I THEN II=I
      : IKUR=CUR
      : PRINT @CUR,RVID$;
6040 PRINT @CUR,A$;NVID$;
6050 CUR=CUR+40
      : '-COMPUTE NEXT PRINT@
6055 NEXT I
6060 IF CUR>320 THEN 6100
      : 'CLEAR BOTTOM?
6070 FOR I=CUR TO 291 STEP 40
6080 PRINT @I,SPACE$(28);
6090 NEXT I
6100 A$=""
      : PRINT @0,"";
      : RETURN
6500 '
7000 '---GET A NAME & NUMBER A$ = IO
7010 POKE 64440,ADDR(IO,1)
7020 POKE 64441,ADDR(IO,2)
      : READ A$
7030 RETURN
7900 '
8000 '---A SOFTWARE INKEY$ WITH
8005 '---A BLINKING CURSOR
8010 KR$(0)=CHR$(255)
      : KR$(1)=""
8020 BKUP$=CHR$(8)
      : CT=1
8030 PRINT KR$(CT/10)BKUP$;
      : CT=CT+1
      : KB$=INKEY$
8040 IF KB$<>"" THEN PRINT " "BKUP$;
      : RETURN
8050 IF CT>19 THEN 8010
      ELSE 8030
8060 '
9000 MENU
      : '---F8 PRESSED! QUIT
9990 ' ----- DIRECTORY -----
10000 'DATA *** NAME *** *** NUMBER ***
10010 DATA BELL TEL LINES 1800 932 0914
10020 DATA TOWER SERVICE 1-455-3274
10030 DATA UGI ELEC 288-6516
10040 DATA PPL ELEC 824-9811
10050 DATA FAA 654-8623
10060 DATA STUDIO 824-4666
10070 DATA LUZ COUNTY CD 822-5115
10080 DATA ARTCO ELECTRONICS 675-2654
10090 DATA BELL LOC TEST 826-4231
10100 DATA WILK TRANSMITTER 822 4594
10110 DATA VAL-TRONICS 655-5937
10120 DATA FIRE W-B 826-8181
10130 DATA FIRE HAN. TWP 825-8521
10140 DATA POLICE W-B 826-8111
10150 DATA POLICE HAN. TWP 825-8521
10170 DATA HOME 696-1489
10180 DATA PORTABLE 100 1-207-236-4365
10190 DATA C.C.MAG 6-9621
10200 DATA HOT LINE 6-4738

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* RPN is a method of entering algebraic
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Olivetti's briefcase micro survived the market politics delaying its introduction into North America, but can it weather a pricing storm?

By JOHN P. MELLO JR.

After months of delays resulting from reported attempts by the Tandy Corporation to block Ing. C. Olivetti & Co. from importing its M10 portable microcomputer into the United States, the Italian firm has persevered; M10s now are being sold in North America.

BACKGROUND. Did Tandy try to prevent the M10 from entering the United States? Officials from Tandy and Kyocera (the Japanese firm manufacturing the Model 100, NEC 8201A, and M10) interviewed by *Portable 100* refused to comment on that question.

According to reports in the computer press, Tandy opposed the M10's entrance into the United States because it would contain the same modem that's in the Model 100. Mark Yamagata, director of personal computer products, told *Portable 100* Tandy holds a patent on the modem in the 100.

This wasn't the first time it was reported Tandy was jealousy guarding the modem in the 100. Similar reports surfaced when NEC introduced the 8201A into this country. At that time, it was reported Tandy's opposition to NEC marketing a Kyocera machine with a modem induced NEC to introduce a modemless 8201A here.

It also was reported that when it appeared Kyocera would be selling Olivetti portables with modems, Tandy filed a lawsuit in Japan to block the deal. Neither Kyocera nor Tandy would comment on whether or not such a suit was ever filed. If a suit existed, Olivetti didn't know anything about it, according to Roberto Rigone, product planner at Olivetti.

Tandy objected to the M10 when it did, said George Christian, personal computer marketing manager at Docutel-Olivetti, because in "my personal opinion they wanted to keep us out of the Christmas market, and obviously that happened."

Christian explained Kyocera notified Olivetti it would go through with its U.S. deal in early January. It has



REVIEWS

been reported Kyocera paid Tandy a substantial sum of money to eliminate the roadblock to importing M10s into the United States. Tandy and Kyocera remain mum on that subject.

However, whatever differences existed between Tandy and Kyocera, they appear salved, since sources within Tandy said the Japanese firm is working on an upgrade of the Model 100 to be marketed later this year.

OLIVETTI'S OFFERING. What does the M10 offer consumers that the Model 100 doesn't? Aside from cosmetics (the M10 is a stylishly two-toned metallic olive and smoke gray with aquatrimmed function and cursor keys), the answer is very little. The two machines are sinfully similar, but two features distinguishing the M10 from the 100 are its liquid crystal display and cassette storage.

The M10's 8-line-by-40-character LCD is hinged and locked into place by a magnet. When the screen is released, a spring holds it at a 30 degree viewing angle. The screen will also maintain a 15 degree angle. This feature addresses the problem some Model 100 owners have finding the proper angle for their machine. This spring arrangement seemed fragile, however, and its ability to withstand wear and tear questionable.

A feature Model 100 cassette veterans will appreciate is the M10 can save and load Basic, machine-language, and text files to and from microcassette recorders with none of the special modifications outlined in Bill Templeton's article (page 48). This is because the M10 uses microphone input, instead of auxiliary input, to store its data on cassettes. I used an

Olympus C100 microcassette recorder and Olympus MC-15 C-T tape with the Olivetti and had a sterling load and save success rate.

KEYBOARDS. Another dissimilarity between the 100 and the M10 are in the computers' keyboards, although both machines have the same number of function keys (12, including paste, label, print, and pause-break) and their cursor keys are identical.

The Olivetti has 73 keys, while the 100 has 72.

The M10 doesn't have the 100's code key.

Programmers will dislike Olivetti making the equals sign a shifted key on the M10 keyboard, although the colon, used for multiple statements, is unshifted.

The first thing a Model 100 user will notice while tickling the M10's keys is delete-backspace has been moved from the top row to the right of the space bar. A 100 user will often hit the Olivetti's bracket key two or three times before realizing delete-backspace is elsewhere.

The M10's control key, located to the right of the space bar, seemed more conveniently located than on the 100, especially if control functions, rather than cursor keys, are used to move the cursor through text.

Tab on the M10 is a symbol (an arrow pointing at a line) rather than a word. This was initially confusing, but easy and quickly adjusted to.

When the number key locks the keypad on the M10, other keys are locked out. This prevents typing strange things into the machine when the number key is accidentally depressed. However, it creates other problems. While in terminal mode, I accidentally depressed the number key. I kept depressing function key 8 and getting a disconnect message, but when I depressed Y, nothing appeared on the screen. After several abortive attempts to cut loose from term, I finally caught on to what happened and remedied the situation.

Charlie Frieberg

THE ITALIAN INVASION

olivetti
M10

BATTERY LOW



CHARACTERS. The M10's main character set is slightly different from the 100's (see photo 1). In practice, I found the letters less legible than the Tandy computer.

The M10 offers two additional character sets: one by pressing graph and any other letter; one by pressing graph-shift and any letter. The graph-letter combinations are primarily foreign characters, with some graphics. The graph-shift-letter combinations are uppercase foreign letters, arrows, mathematical symbols, money symbols, and phone, plane, car, and hotel symbols.

EXTERNALS. Every port the 100 has the M10 has, too (see photo 2).

The RS232 connection worked fine with the Model 100, and the two computers traded files (with the help of a null modem) without a hitch. However, when connected to a TRS-80 Model 4P using Microterm, the M10 refused to upload files. According to Olivetti, the M10 is perfectly compatible with its other computers, including its M18 MS-DOS microcomputer.

The M10's Centronics parallel port is identical to the 100's and the Olivetti's printer cable works with both machines. One catch here is the Olivetti cable fits into its socket with the tab side facing down instead of up.

The phone and tape plugs are identical to the 100's.

Both computers can share 6-volt DC adapters. This applies to alternate power sources, also, like the Prairie Power gel cells reviewed on page 72.

A recessed reset button makes it more difficult to accidentally reset the machine (although I've never accidentally reset my Model 100 with its protruding button).

Unlike the 100, the M10's bar-code reader socket is also on the rear panel. The socket is for a Hewlett-Packard HED-3050 or HEDS-3000 bar code reader.

BOTTOM. Olivetti chose to segregate the compartments for the system bus and ROM slot (see photo 3). It also made the bus connector a male instead of a female plug. The plug's pins are round, making them sturdier than flat pins (like the pins on Tandy's Disk Video Interface). Overall, Olivetti's bus set-up, while still a fragile one, is more rugged than the 100's.

The M10, unlike the 100, doesn't

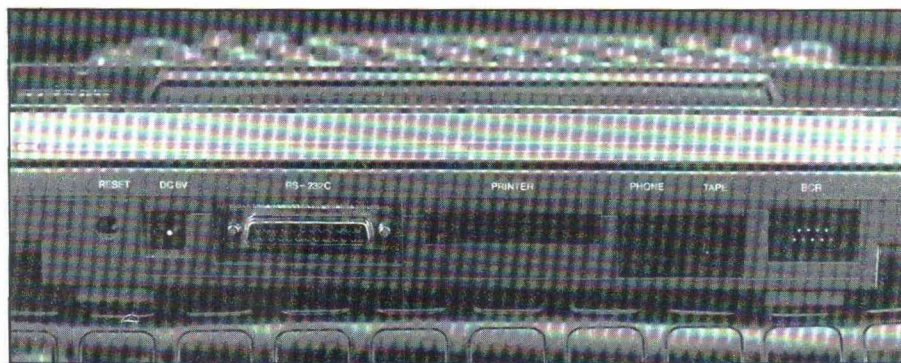
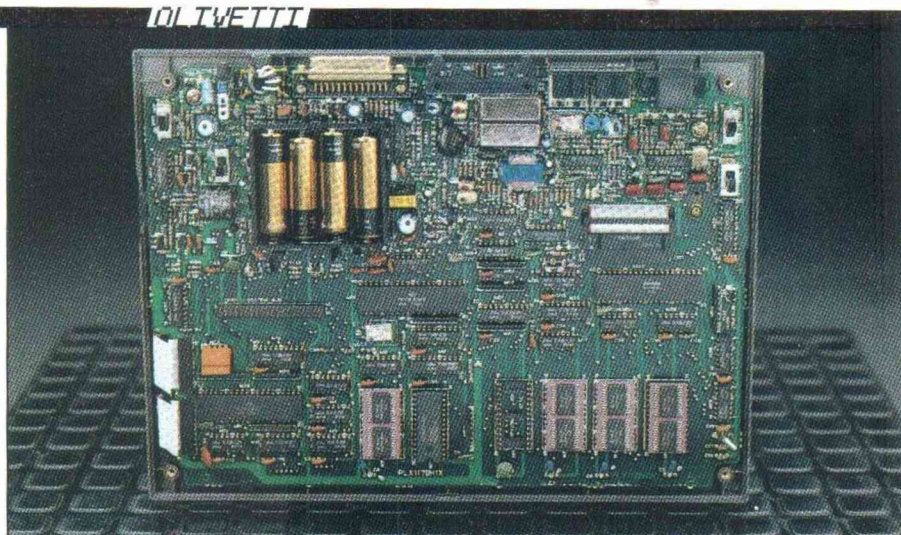


Photo 2. Rear Panel of M10.

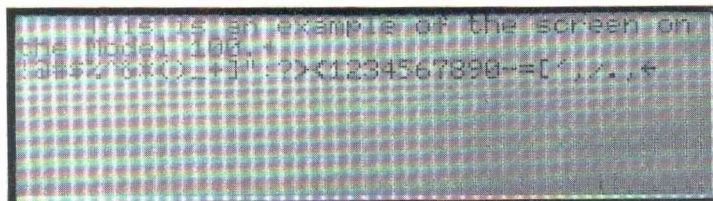
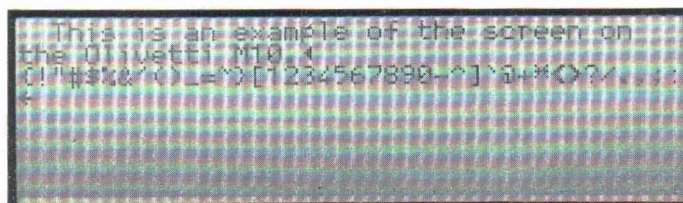


Photo 1. Olivetti and Model 100 Screens Compared.

Charley Frieberg

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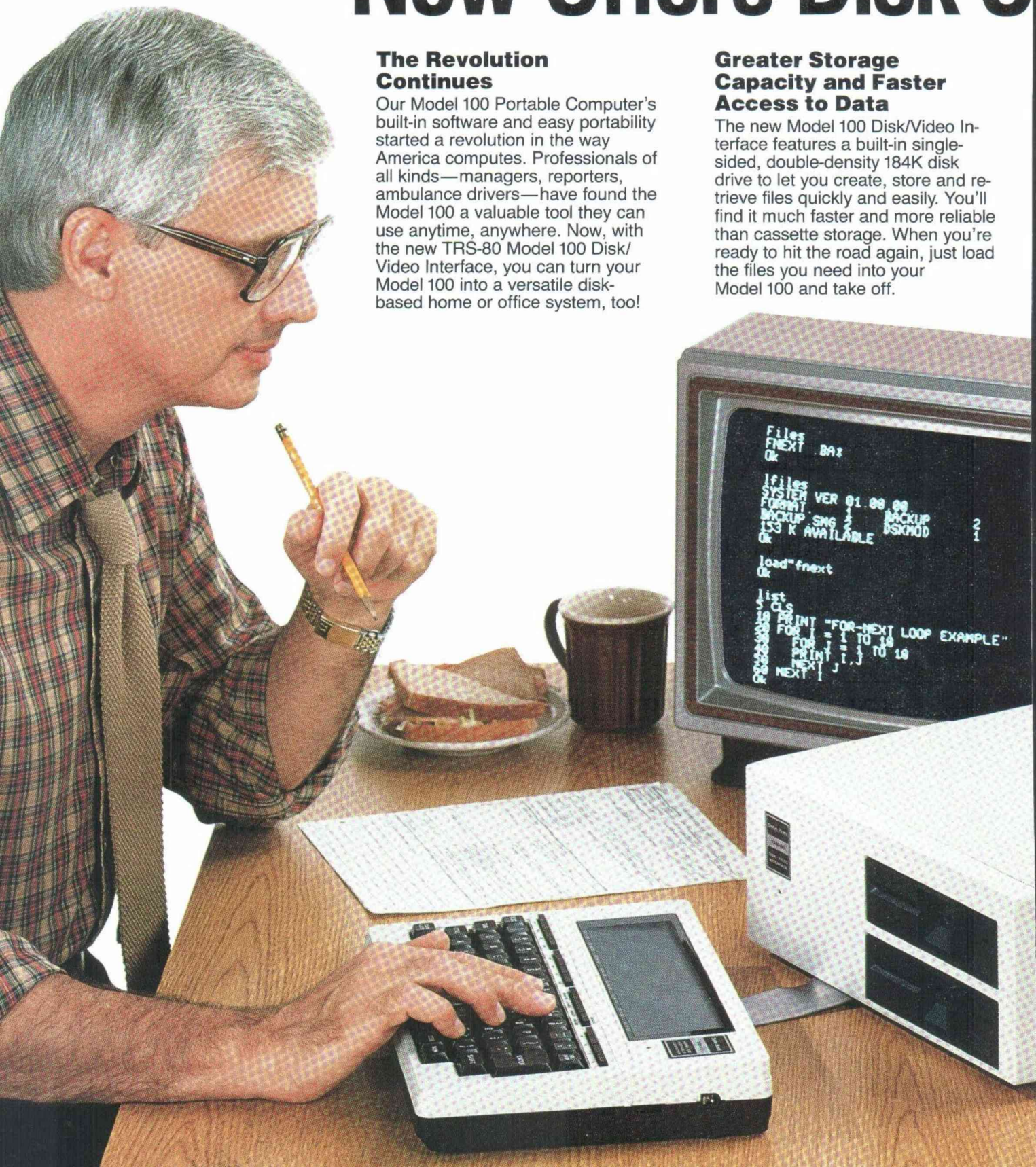
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```
Files
FNEXT  BA:
Ok

If files
SYSTEM VER 01.00.00
FORMAT
BACKUP SNG 3    BACKUP    2
133 K AVAILABLE DSKMOD    1
Ok

load=fnext
Ok

list
3 CLS
10 PRINT "FOR-NEXT LOOP EXAMPLE"
20 FOR I = 1 TO 10
30 PRINT I, J TO 10
40 NEXT J
50 NEXT I
Ok
```


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*Installation not included. Prices apply at participating Radio Shack stores and dealers. TRS-80 Model 100, Disk/Video Interface and TV sold separately. CitiLine is a service mark of Citicorp.

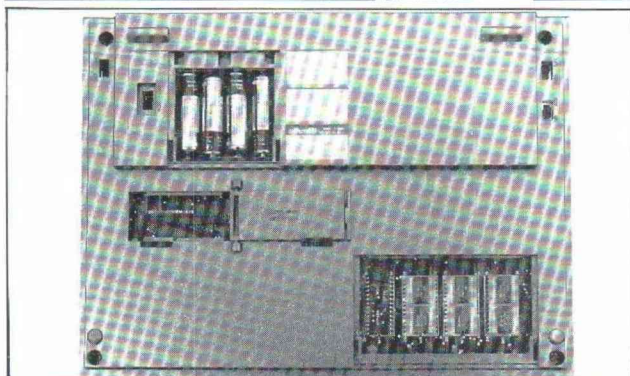


Photo 3. Bottom of M10.

have to be taken apart to upgrade its RAM or add a ROM chip. Removing the panel to a second compartment in the machine exposes the RAM and ROM sockets and makes upgrading the machine less traumatic than with the 100.

SOFTWARE. The M10's built-in software works identically to the 100's. The Basics are alike, so programs written in Basic (and without machine-language subroutines or POKEs) will run on the Olivetti. According to Olivetti's Don Herrick, most of the ROM addresses in the M10 are offset from the 100's by several bytes.

During the last several months, Olivetti has been contacting Model 100 third-party vendors and soliciting their assistance in supporting the M10. So far, Traveling Software of Seattle, WA, has been the only vendor to jump into the Olivetti market, but a spot survey by *Portable 100* indicates others are ready in the wings.

DOCUMENTATION. The M10 comes with a 4-inch-by-8.25 quick reference manual and an "operations guide," also in a convenient size (4.75 inches by 8.25 inches).

The operations guide is divided into 15 sections covering the applications programs in the machine, cassette loading and saving, and Basic.

The five Basic sections in the manual are well-written and easy to understand, and section 15, explaining each Basic word and function, is a great tool for any beginner in the language.

There are eight appendices in the manual — including a detailed listing of error codes and what they mean — but no index.

WILL IT FLY? Will the M10 start siphoning potential customers from Radio Shack? Tandy's Yamagata doesn't think so. "The market is big

enough," he told *Portable 100*, for all three companies in the Kyocera sweepstakes.

But as a late starter in the North American market, the M10 will have to overcome some tough initial obstacles. One of them is distribution.

Christian of Docutel said Olivetti has 450 dealers in the United States. He added the M10 would also be offered to mass-merchandisers carrying Olivetti products.

Docutel, Olivetti's American marketing arm, will be going outside its established network to sell M10s, Christian said. Although he declined to name the possible new outlets, Christian noted they would provide substantial additional distribution for the M10. One of the potential distributors alone had more than 1000 outlets, he added.

Asked how many M10s Olivetti expected to sell in the United States, Christian declined to make that information public. But apparently Olivetti is setting some aggressive sales goals in Canada, where Product Manager Patricia Smith said the company plans to sell 10,000 units this year.

An even tougher obstacle to the M10's success will be pricing. In April, the month the M10 was introduced at \$799 for a 8K machine and \$999 for a 24K machine, Tandy slashed \$200 off the price of the 100, selling 8Ks for \$599 and 24Ks for \$799.

Yamagata said Tandy's sale had nothing to do with Olivetti's planned entrance into the American market. And Christian agreed with him: "I'd like to think it was us, but honestly, I really don't."

The Docutel marketer said Olivetti would maintain its price structure as long as its competitors limited their price cutting to sales and special promotions, but he admitted that if Tandy kept its 8K price at \$599, "everyone is going to have to react to that." ◀

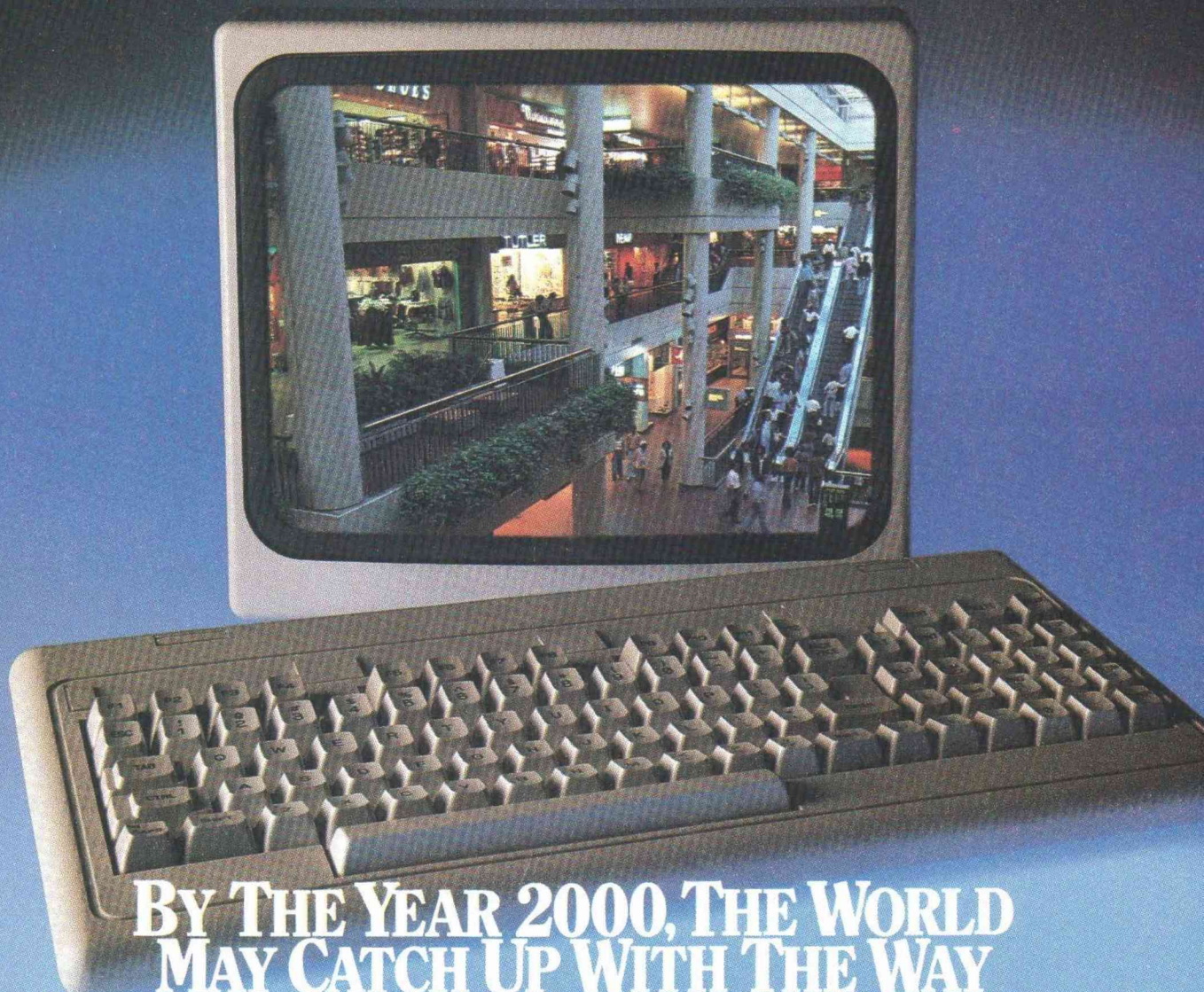
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MICRO RECORDERS SHRINK MASS STORAGE MEDIUM FOR MODEL 100



The Model 100 isn't tailor-made for microcassette storage, but don't let that stop you from pairing your MEWS with a pygmy recorder.

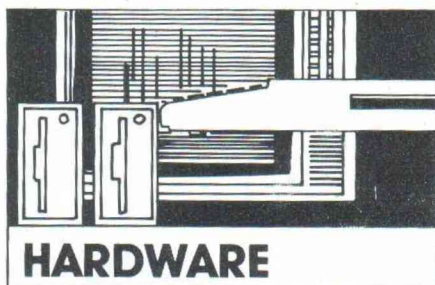
BY BILL TEMPLETON

Have you taken your Model 100 on a trip recently and pined for just a few more bytes of storage? You're all set to use your 100 to write an important document to send a few hundred miles away via electronic mail, but alas, you're out of memory!

The solution? A microcassette recorder — something easy to carry in one of the many cases for the 100 on the market.

WHICH IS BEST? It won't take long in your search for the best recorder to find several 100 users have been researching this subject and have reported their findings to the Model 100 Special Interest Group on Compu-Serve.

These owners, including this author, have tried many different recorders, but soon found that, because of the 1500 bits per second data transfer rate of the 100, only the higher quality recorders, running at a tape speed of 2.4 cm/sec, would consistently and reliably do the job.



The names Olympus and Sony appeared often in the online conversations on recorders working best with the 100. And the specific models mentioned most often were the Olympus Pearlcorde models C100 and X-01, and the Sony Micro Magneto-Cassette recorder, model M-202.

ABOUT EACH RECORDER. The Olympus Pearlcorde C100 was announced late last year as the first microcassette data recorder on the market and, because of the ease of interfacing it to the 100, became the popular choice among SIG-100 members.

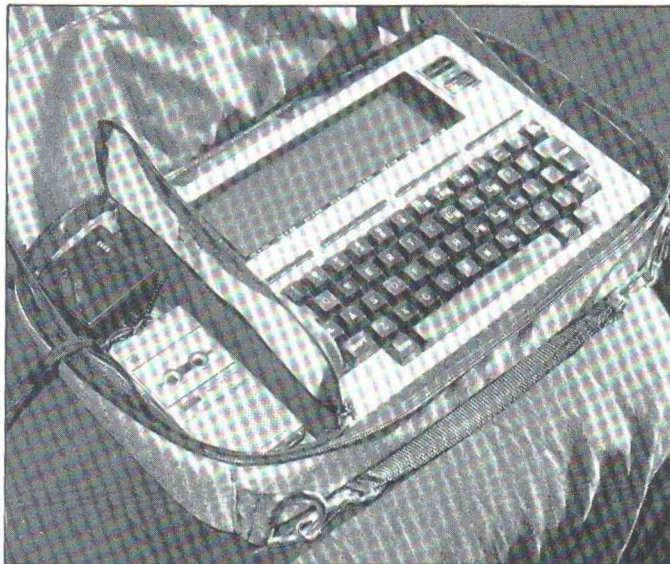
The most popular features of the C100 are its size (5.4-inches by 2.6-

inches by 1.1-inches), its weight (10.2 ounces), and the ease the 100's cassette plug fits into the three jacks located at the top of the recorder.

Olympus points out three other special features on the C100: instant cue/review (fast forward/rewind, independent of the 100); a monitor switch enabling you to listen to data being saved on the microcassettes; and a phase reverse control switch that ensures compatibility with any computer used. The phase switch isn't required when using the C100 with the 100, according to most users I've polled.

The Olympus Pearlcorde X-01, discontinued to make room for the X-02, was a popular choice for those looking for the smallest unit with a digital LCD counter and soft-touch controls. Because of its small size, the X-01 has sub-mini jacks and requires two optional plug adaptors (2.5mm to 3.5mm) to use the 100's cassette cable.

The later models, the X-02 and XR, are very difficult to interface to the 100 because of a special 7-pin remote control connector, instead of the single-pin



Olympus C100 fits comfortably in case manufactured by Kangaroo Video Products Inc.

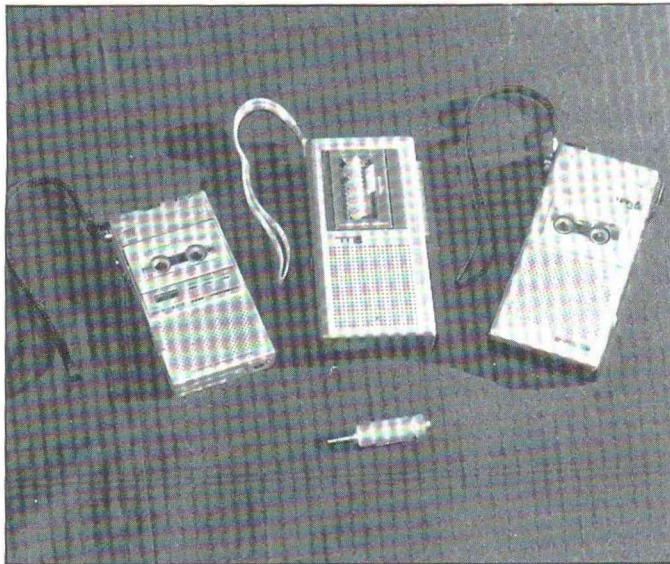


Photo 1. Three Microcassette Recorders and Radio Shack Adapter.

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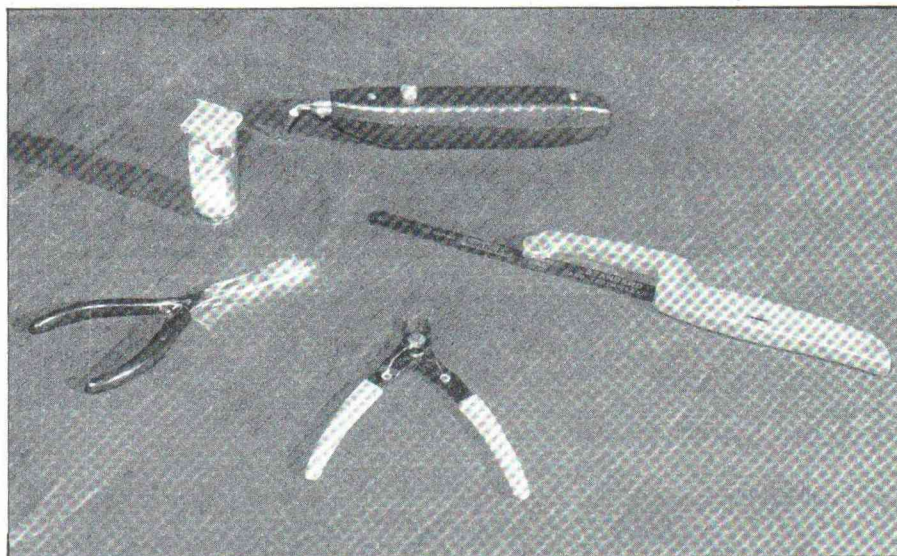


Photo 2. Tools for Modifying Adapter.

remote jack found on the C100 and X-01.

Even though the X-01 is a discontinued model, it is included in this review because it can still be found at large mail order camera stores at very attractive prices. Some physically handicapped 100 users require solenoid actuated switches and have found the X-01 the best choice for their needs. It is definitely the smallest (4.7-inches by 2.4-inches by 0.7-inches) and lightest (6.9 ounces) of the three microrecorders reviewed.

The Sony M-202 worked very well with the 100, after installing a remote control switch to alleviate the constant use of the manual pause switch on the

Sony when the 100 needed to turn the recorder on and off. The size of the M-202 (5.75-inches by 2.6-inches by 1.1-inch) is between that of the C100 and X-01, and weighs the most (13.75 ounces), but seems to be the most rugged and least sensitive to abuse.

The Sony M-202 has the added feature that you can visually confirm the transfer of data by monitoring the intensity of a light-emitting-diode mounted on the front panel of the recorder near the record button.

Neither the monitor switch on the C100 nor the flickering LED on the M-202 can detect any bad spots on the tapes, and thus do not take the place of

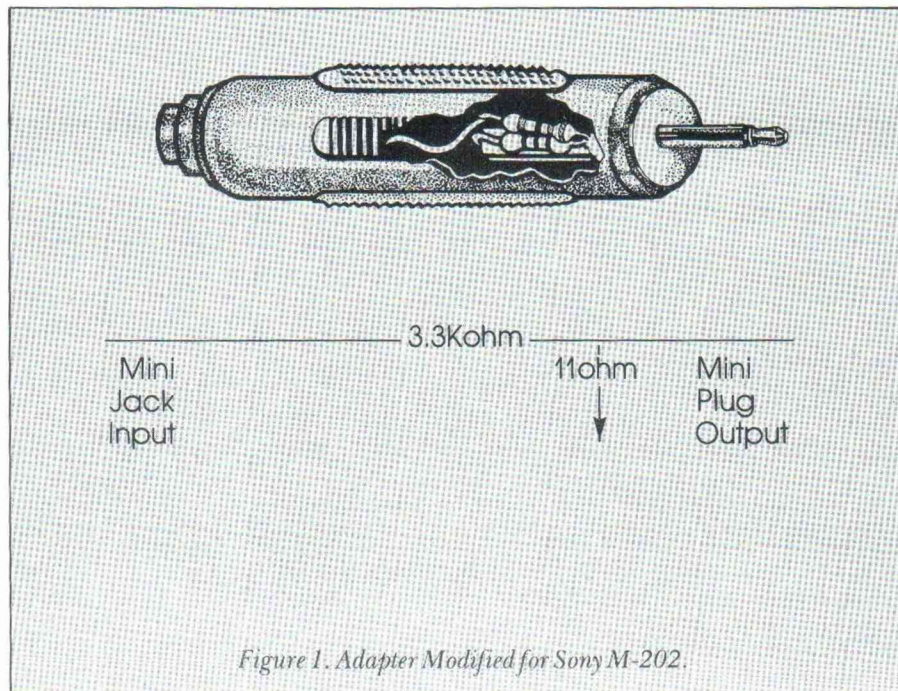


Figure 1. Adapter Modified for Sony M-202.

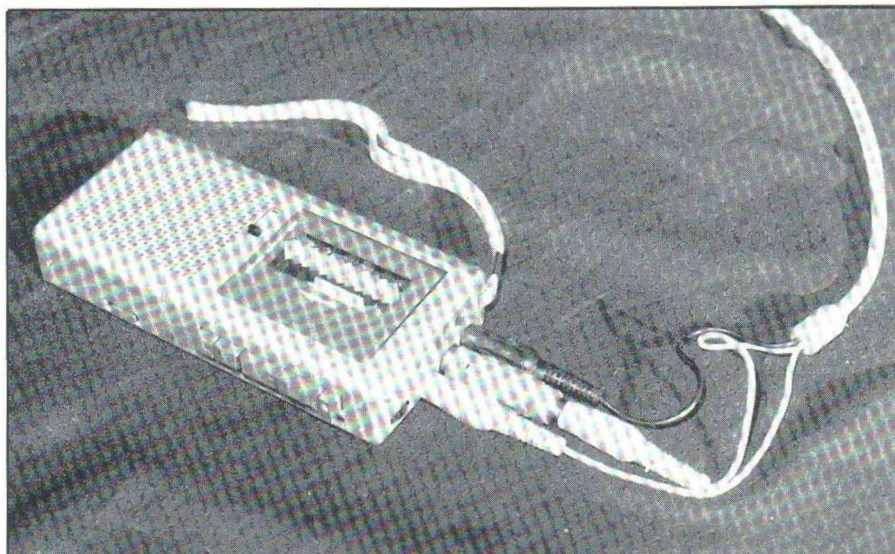


Photo 3. Adapter Fits in Microphone Jack.

verifying cassette saves! They're merely time saving indicators that let you know you are recording data from the 100 to the recorder.

WHAT'S THE CATCH? If you try to record data directly from the 100 to any of the recorders available today, you will quickly find you are missing one very important ingredient, commonly known as auxillary (AUX) input.

Before you can use the 100 reliably with any microcassette recorder, you must reduce the 100's recording signal by a factor of 15 to 25 decibels to match the microphone input voltage level required by the recorder you're using.

You can modify a standard Radio Shack signal reducer shown with three recorders in photo 1, or you can assemble these parts in the DIN connector of your 100's cassette cable (*Portable 100*, January 1984, page 20).

The advantage of using the mini-jack plug adapter (Radio Shack catalog #274-301, \$1.99) is you can use the same cassette cable with the standard-sized recorder needed for commercial software.

In the case of the Sony M-202, a simple all-resistive voltage divider circuit (shown in figure 1) is all that's required. If you plan to use either of the Olympus recorders, you will need to build

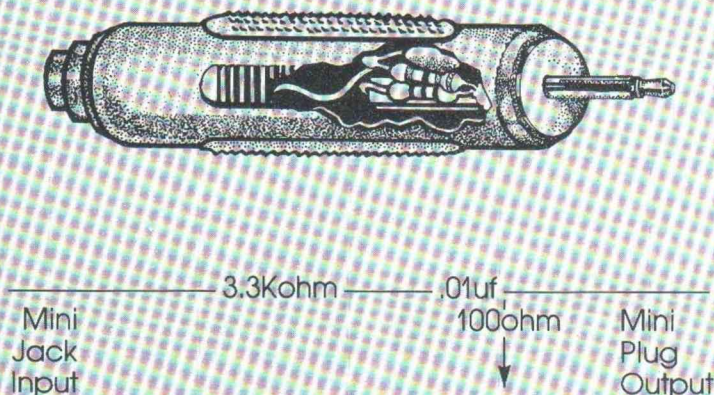
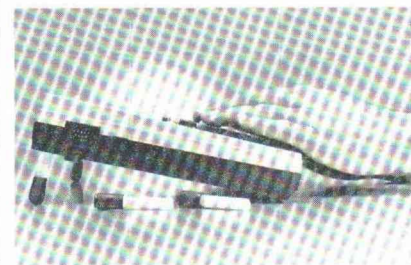


Figure 2. Adapter Modified for Olympus Recorders.

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the simple resistor-capacitor voltage divider circuit shown in figure 2.

All of the components shown in figures 1 and 2 are standard, off-the-shelf parts available from any electronics dealer or from a local Radio Shack store for less than \$1.

BUILDING IT. My recommendation is to buy the Radio Shack signal reducer and use the tools in photo 2: small vice, hacksaw, pair of needlenose pliers, soldering iron (25 watts or less), and 60-40 rosin core solder.

If your adapter (also called an attenuator) is to be used with a Sony M-202 recorder, carefully saw the red plastic cover, about 1/4-inch from the female end, until you have two separate pieces connected by the center wire.

Using the soldering iron, remove the 11 ohm resistor on the female end of the adapter. Then remove just enough red plastic material so you can solder the two metal-cylinder halves together to provide a good return-ground path for the recording signal.

Finally, fill any gaps in the red plastic cover with a good silicon sealant, or melt the red plastic material with the side of your soldering iron to form a final seal for added strength.

OLYMPUS MOD. If your adapter will be used with the Olympus C100 or X-01 recorders, carefully saw the red plastic cover about 1/4-inch from the male end until you have two separate pieces connected by the center wire.

Use your long-nose pliers and gently remove the 11-ohm resistor inside the female end of the adapter.

Next, using the soldering iron, long-nose pliers, and vice, replace the 11-ohm resistor on the male end of the adapter with a 100-ohm resistor, and add a .01 uf ceramic capacitor between the existing 3.3K ohm resistor and the center wire from the female end of the adapter.

As the final step, solder the two metal cylinder halves together and form a final seal as with the Sony adapter. Use your needlenose pliers as a heat-sink wherever possible to avoid overheating the components, and insulate any exposed wires with plastic tape or heat shrink tubing to prevent unwanted shorts.

Providing you have done your soldering properly, you are now ready to use your adapter to save either programs or text on microcassettes!

THE FINAL TEST. By inserting the signal reducing adapter between the microphone input of the recorders, and the larger grey plug on the 100's cassette cable (see photo 3), you are ready to begin saving your Basic files, data-text files, or machine-language files to tape.

As with larger, standard sized recorders, it is recommended you verify information stored on a microcassette, and that you make a backup of any important files on a separate tape or disk.

It is also generally recommended you use the microcassettes recommended by the recorder manufacturer — the Olympus MC-15/CT tapes with the Olympus C100 and X-01, and the Sony MC-60's with the Sony M-202. If you use Olympus MC-15/CT tapes with other recorders, you will probably have to turn your 100's sound off to achieve a good load.

Several 100 users are now storing as much as 256K bytes on a single side of a C-60 microcassette tape. The shorter MC-15/CT tape, recommended to reduce file search time, will hold up to 64K on a single side, or 128K using both sides.

THE FINAL CHOICE. It's up to you. Use these guidelines to help you decide which recorder would be best for your needs.

Although the suggested retail price on the Olympus C100 is \$122.50, you can buy it from the large mail-order camera stores for \$79.95 (Wall Street Camera Exchange, N.Y., 800-221-4090) or \$89.95 (Olympic Camera, L.A., 800-421-8588). The original price of the Olympus X-01 was \$269.50, but can still be found at the same mail order camera stores, while the stock lasts, for under \$100.

You will also find, if you call Sony Headquarters (800-222-SONY), that the M-202 has been replaced with a newer M-205A, with essentially the same specifications, at a suggested retail price of \$99.95. The cost of adding a remote control switch would be extra and would depend upon who does the installation.

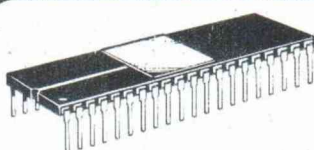
The key question remains: Which is the best recorder to buy for use with your 100? The consensus of opinion seems to point to the Olympus Pearl-recorder C100. It was designed for voice and data recording; it is the latest unit on the market; and it works well with the 100 — provided you follow the steps described in this article! ◀

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LDOS GIVES MODEL 100 MASS STORAGE

There are programs on the market to make a desktop the 100's slave, but for TRS-80 owners, LDOS is all they need.

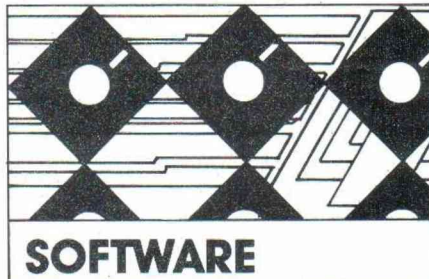
By JEFFREY W. LEVIN

Have you been looking for an easy way to get your 100's document files uploaded to a TRS-80 Model I/III/4 computer where they can be refined via a full-feature word-processing program? If so, you probably haven't had much luck. As of the November issue of the *TRS-80 Microcomputer News*, Radio Shack has published only one short article on transferring files between the 100 and its Z-80-based personal computers.

The technique described in the article (from the November 1984 issue) is painfully awkward, mainly because it requires the larger computer to be configured as a terminal, rather than a host. When you connect the Model 100 via a null modem, what you have in effect is a terminal communicating with a terminal—an inefficient “who's-in-charge-here” arrangement which necessitates keyboard input on both units before a file can be transferred.

Fortunately with the 5.25-inch disk drives in the Z-80 Tandy micros, a means exists to transfer files quickly and efficiently with keyboard entry, coming solely from the Model 100. The only software required is a product which Radio Shack wisely added to its line a little over a year ago: Logical System's superb LDOS operating system.

BRIEF OVERVIEW. Back in the days of Model I TRSDOS versions 2.0 to 2.3, a TRS-80 user was pretty much locked into Radio Shack's peripheral devices, especially in the area of disk drives. Fortunately, there were some very sharp system programmers among



Model I users who weren't about to take this lying down, and they are responsible for the alternative operating systems which supported a wider range of peripherals.

Apparat's NEWDOS-80 was the first to gain wide acceptance, and is still popular today. Early in 1981, LDOS appeared, heralded by advertising claims it put “muscle in your TRS-80.” The claims were entirely justified; Model I users soon began discovering just how powerful and flexible their systems could be.

The technique for transferring Model 100 documents to a Model I/III/4 makes use of two major innovations which LDOS introduced to TRS-80 users: device independence and job control language.

DEVICE INDEPENDENCE. Simply stated, this enables you to configure your system's input-output in whatever manner you want. You can run just about any disk drive, printer, or RS232 device in existence; you can customize keyboard input so the pressing of a key in conjunction with a control key results in an entire sequence of keystrokes being produced; you can

make a disk file into an input or output device; you can route from one device to another or link two devices together; you can filter a device in some unique manner, customization options approach infinity.

What's also nice is whatever system configuration you construct can be conveniently stored to disk. A reconfiguration will automatically occur whenever you initialize your system using the same disk anytime in the future.

JCL. The job control language is a feature enabling you to get prestored keyboard input. This permits you to make occur an entire sequence of LDOS system commands and application programs in response to a simple command. Unlike the files you construct with the build command under TRSDOS, JCL files permit user input, variable names, and conditional branching. All of these features will be used in a JCL file for 100 uploading.

Radio Shack began marketing LDOS in the fall of 1982 when it came out with a hard disk drive for the Models I and III. After the headaches Tandy had encountered in developing a reliable floppy disk operating system, acquiring a powerful independent operating system was irresistible. Already field-proven on hard drives, this was the obvious choice when compared to the alternative of developing a hard drive TRSDOS. (The TRSDOS 6.0 operating system which Radio Shack provides with its 64K Model 4 is actually a modified version of LDOS.)

CONFIGURING THE 100. There have been several revisions to LDOS since it was first marketed. As of this article, the most recent version is 5.13. If you have an earlier edition, you may have to acquire the most recent one before the techniques described in this article will work. If you have a Model 4, you'll have to be using LDOS in the Model III mode.

First, make a backup copy of your master LDOS 5.13 disk. Do a directory listing and be sure the RS232T/DVR (RS232R/DVR if you're using a Model I) and PR/FLT files are on the disk. Follow the manual's instructions for installing LBasic if it's not already installed.

At the LDOS Ready prompt, type the lines in exhibit 1, terminating each one by pressing the enter key.

THE HOST. If you've typed everything correctly, the video display now should be operating much slower than usual. Press the enter key a couple of times, and the prompt LDOS Ready should repeatedly come up one character at a time, like you're on line with a time sharing service.

Guess what? Your Model I/III/4 is now a host for your 100! As soon as you connect the two units together via telephone or a null modem, you can enter LDOS commands directly from your 100 keyboard, with everything which appears on the larger unit's video display echoed back to your 100 video. No further keyboard input is necessary on the unit running LDOS.

If you're going to connect the units

via a null modem, you later can change the baud value in the above Set command to a much higher number. For now, let's just preserve the current settings by typing:

SYSTEM(SYSGEN)

and pressing enter. This stores the current device configuration in a system file. The configuration will automatically be reloaded every time you boot the system with the disk currently in your drive zero.

ON THE 100 END. You should enter the TELCOM program and use the Stat function to configure your RS232 to match your new host. With a tele-

phone connection, the setting should be M8N1E; with a null-modem connection, use 38N1E for now.

As soon as the two units are connected and you enter the Term mode on your 100, the LDOS Ready prompt should appear on your screen as soon as you press enter a couple of times. Try executing simple LDOS commands such as Dir and Free from your 100. Whatever appears on your larger unit will appear on the 100 as well, with wraparound occurring when the length of a line exceeds 40 characters. If you make a mistake and need to backspace, don't be concerned if the previous characters don't disappear from the 100 display; the backspaces are being effectively transmitted to your larger unit.

You even can run some application programs from the 100. Programs which use direct video addressing (which includes almost all machine-language programs) will not work. This is because what you see on the screen bypasses the larger computer's video driver, and thus its RS232 line altogether. If you want to write a Basic

```
Preparing to upload a Mod 100 document
and save it to disk in an ASCII format
SET *CL RS232T (BAUD=300,WORD=8,PARITY=OFF,STOP=1,DTR,BREAK)
FILTER *CL USING PR/FLT (ADDLF)
LINK *DO *CL
LINK *KI *CL
```

Exhibit 1. LDOS Configuration Commands

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program on your host which will run well from the 100, avoid using PRINT@ statements and PEEKing and POKEing addresses in the video display area.

FUSING. Transferring information from the 100 to the LDOS-equipped unit would normally require typing a sequence of commands for every file to be uploaded. However, thanks to LDOS's JCL feature, the sequence only has to be typed in once! At the LDOS Ready prompt, type:

BUILD TRANSFER

and press enter. After a brief pause, you can type the lines in exhibit 2, ter-

```
Preparing to upload document
and save it to disk in an ASCII format
//IF -FILE
//ASSIGN FILE=TRANSFER/ASC
//END
SYSTEM(BREAK=OFF)
COPY *CL TO #FILE# (ECHO)
SYSTEM(BREAK=ON)
//EXIT
```

Exhibit 2. JCL File for Data Transfer

minating each one with an enter. (Note: If you still have your two units tied together, there's no reason why you can't be doing all of this from your 100 keyboard!)

Be sure to include the first two lines which begin with a period. These are text lines, and a JCL file has to begin with at least one line of text. After the last line, press break on your LDOS unit (or control-A if you entered the lines from your 100.) This closes the newly-created JCL file.

PREPARATION. If you have a document file ready for transfer, the only thing you have to do to prepare your Model I/III/4 to receive the file is to type:

```
DO TRANSFER (FILE=Filename/
extension)
```

at the LDOS Ready prompt. (Be sure to use a "/" instead of a period between the filename and the extension; it's easy to get in the habit of using periods after using the 100 for a while.)

If you prefer, you can forego use of this option altogether, and a filename

of Transfer/Asc will automatically be assigned.

As soon as the line from your JCL file, which begins with the word copy, appears on your 100 monitor, you can use the <F3> upload key to designate a document file for transfer. Be sure to default in response to the 100's width prompt, so hard line feeds won't be transmitted with your text. If you do permit these line feeds to be transmitted, you won't be able to use the right-justification feature of your word processor.

SCROLLING ALONG. If you've done everything right to this point, your text should be scrolling up the screen of both computers as it gets written out to disk. What you see on the 100 monitor is exactly what is being received on the other end, and this makes it easy to verify the data's integrity.

When the transmission is complete, just press control-A on the 100, and the disk file will be closed. The JCL file will cease executing, and the LDOS Ready prompt will reappear.

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```
10 OPEN "O":1,"ZERO/ASC"
20 PRINT#1,CHR$(0);
30 CLOSE1:END
```

Program Listing 1. LBasic program.

ONE MORE PROBLEM. If the word processor which you use on the Model I/III/4 is Radio Shack's SuperScripsit (which RS has published LDOS patches for), you're not home free . . . yet. The ASCII conversion utility which comes with the package will not convert the file you've just transmitted into a Scripsit-compatible format.

For some reason the conversion utility was written to work with only ASCII files terminated with a zero byte. This holds true whether you're running the software on either TRS-DOS or LDOS. If the file which you're trying to convert does not end with a zero, the utility will abort with either of the two following error messages:

ATTEMPT TO READ PAST EOF

RECORD NUMBER OUT OF RANGE

This precludes the conversion of ASCII files generated by a number of different sources, including the Video-text Plus terminal package which Radio Shack recommended for use in the file transfer in its November article.

THE ONE-STEP. To get around this problem, I went into LBasic and wrote the three-line program in listing 1. What this program does is create a file consisting of a single zero byte. You only need to run the program once; there's no need to save the Basic code. Once the Zero/Asc file is created, you only need to append it to your ASCII file, and the file then can be converted into a SuperScripsit document.

Since Append is a standard LDOS command, I simply added one line to my JCL transfer file (exhibit 3).

TREND-SETTER. So there you have it. A simple, execution-wise, one-step process for getting a document from your 100 to a disk file which can be loaded into your full-feature word-processing package. With an auto-an-

swer modem on your personal computer, you now can run it and transfer files to it from anywhere in the world! And I'm sure that many variations on my basic technique, such as totally unattended transmission, will be popping up in magazine articles in the near future.

I read Jim Hughes' article about his troubles in communicating with CP/M in the October issue of *Portable 100*. I've tried unsuccessfully to set up a host operation on an IBM PC using MS-DOS. I think it's a tribute to the genius of the LDOS authors that they've created an operating system so powerful it totally supports a revolutionary device which didn't exist when they began. ◀

```
//IF-FILE
//ASSIGN FILE=TRANSFER/ASC
//END
SYSTEM (BREAK-OFF)
COPY *CL TO #FILE# (ECHO)
APPEND ZERO/ASC TO #FILE#
SYSTEM (BREAK=ON)
//EXIT
```

Exhibit 3. Modified JCL File

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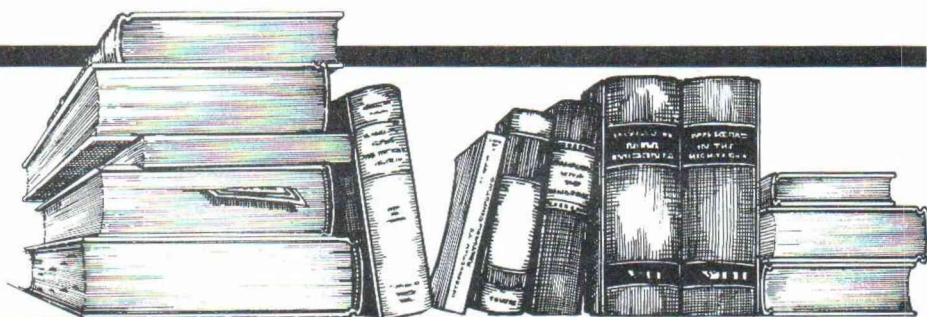
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BOOKS



TANDY LAB ONLY GOOD AS MATH REFRESHER

TRS-80 Model 100 Basic Language Lab

Tandy Corporation
Radio Shack
Fort Worth, TX 76102
Cat. No. 26-3821
Manual and cassette tape
\$29.95

By DAVID DUNN THOMAS

When first advertised, I thought TRS-80 Model 100 Language Lab would be a software program. The local Radio Shack personnel thought so too! We understood it'd enable the user to sit at the computer, run the program, and receive hands-on experience in Model 100 Basic.

Not so by a long shot!

First, let's examine the package:

- One 204-page manual in a three-ring loose leaf binder; and
- One cassette tape containing three programs: a simple calculator, a simple musical memory game, and descriptive statistics, an application program that prints histograms.

The format of the manual clearly indicates we have a classroom textbook on our hands, no matter what the advertising and sales personnel state.

There are 15 "lessons" rather than chapters. The lessons consist of *detailed* instructions for the conduct of each experiment. There are from four to nine per lesson. Many of the instructions in the manual are frequently repeated. The manual states "The programs used ... will be explained line by line...". Yea verily! This user lost track of the number of times he learned about the command for clearing the screen.

FORMAT. Following two lessons in basic Basic and the 100's saving-loading sequences, the lessons become almost totally business oriented with about 77

percent of the programs demonstrating business applications while teaching INPUT; CLEAR; PRINT USING; IF, THEN, ELSE; STEP, DIM, GO-SUB, and TAB.

Most of the other exercises are concerned with computer functions such as \$, SOUND, EDIT, RND, and PRINT@.

The manual is fairly well-indexed with some weaknesses. Generally a command is indexed for the first discussion; no more advanced coverage is indexed later. Appendices are non-existent.

These are errors I discovered; corrections are shown in parentheses:

- "The smallest line allowed is 1," page 12. (0 is often used.)
- "The number of files which can be saved is limited only by the amount of RAM available," page 17. (A user is more likely to run out of space on the menu than run out of RAM.)
- "DIM Y(24) ... a subscripted variable having a maximum of 24 storage locations...", page 93. (0 to 24 = 25 locations).

MANUAL DEFICIENCIES. Unfortunately, the text wasn't without its inaccuracies:

- On pages 3, 4, 19, and 33, the screen drawings are misleading or don't match the text.
- On page 58, it's indicated THEN isn't needed with IF-GOTO. Far better programming advice would be the GOTO isn't required with IF-THEN.
- On page 61, where the STRING\$ command is discussed, there isn't one word suggesting use of STRING\$(n,n). The STRING\$(40,"*") is described rather than the better STRING\$(40,42).
- On page 62 and 64, there's an awkward method of determining the value of the variable HH. Why not HH = VAL(LEFT\$(TIME\$,2)) right away instead of defining HH\$ first?
- On pages 70-86, during the discussion of using EDIT, there's not a hint of using EDITnn. Examples lead one to believe to change one character in one line, the entire program must be subjected to the EDIT command.
- There aren't any instructions for

emptying the paste buffer.

None of Language Lab's programs are packed, therefore each uses 7.35 to 17.8 percent more memory than necessary. And none of the programmers seem to have heard about IF-THEN-ELSE.

The simple calculator program included with the package has the advantage of handling parenthetical arguments; nesting 10 deep is allowed. The shift key is required for multiplication, addition, and caret entries. However, the program has got to be scary for a rank beginner; there are no prompts. The first thing encountered on running the program is a blank screen; it surely smells of cold start time!

Memo is a sound memory game program. There's not much to see and it's on the slow side.

Stat is probably meant as the graduation present: "This program computes a variety of common statistical measures on a set of data." The data comes from a text file out of RAM or cassette. Data may then be listed as stored, sorted, relisted in sorted order, then graphed in histograms. However, when Stat graphs its results, the base line is one unit instead of zero. All operations may be output to a printer.

Though certainly not valueless, for some reason the importance of the three programs escapes me. On page 151, though, there's a cute little slot machine game, erroneously referred to as an animation exercise.

OTHER GRIPES. Though there are undoubtedly thousands of 100 users, many haven't the foggiest idea what MEWS stands for. It'd appear Tandy is welded to the idea the 100 is synonymous with *Business Executive*. The users who are journalists, teachers, doctors, and hobbyists don't fit into Tandy's software scenario.

So if you want a classroom textbook for training businessmen in *some* uses of the Model 100, try Basic Language Lab ... a refresher course in business mathematics. ◀

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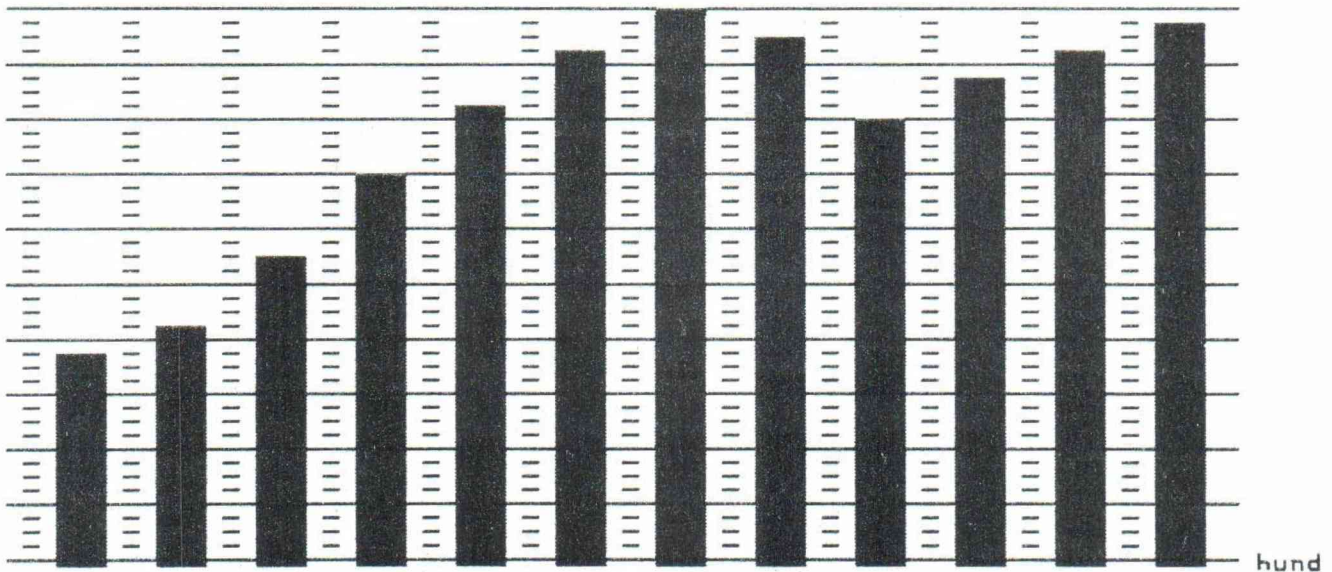
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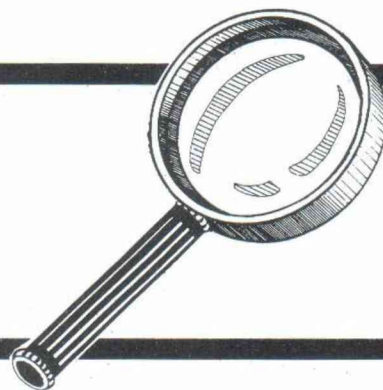
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REVIEWS



ECHO BOX GIVES THE 100 A VOICE OF ITS OWN

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\$150

By GLEN C. BIRBECK

Among the exhibits of the "world of tomorrow" at the 1939 World's Fair, was a machine that spoke. A project of the Bell Labs, the machine was operated by a human, not a computer. It was called the Vocoder.

Learning to operate the machine took a year or more of sitting at its large, organ-like keyboard. Sounds were produced by rapid manipulation of switches. If the right switches were moved in the right order, something resembling human speech came out.

By 1961, Bell Labs was using million dollar mainframes to produce a high-quality synthesized voice. Today, with just a few silicon chips, the Model 100 not only synthesizes speech, but actually speaks from text.

The Echo speech synthesizer, from Street Electronics, is an example of just how far this technology has come since 1939.

TI CHIP. The Echo is built around a Texas Instrument's TMS 5220 speech-processor chip. The chip uses a method called linear predictive coding to model the human vocal tract.

It is the size and weight of a small transistor radio. A calculator-type transformer powers it from the AC line. The Echo contains its own speaker and a socket for external speaker or headphone.

To the host computer, the unit looks like a modem. It is connected to the computer's RS232 port by a simple

cable (supplied).

Switches on the Echo set the serial transmission rate from 75 to 9600 baud. Echo will buffer up to 1744 characters from the host before sending a busy on the status line. It comes with a transformer pack, RS232 cable, and manual.

MANUAL. The 46-page manual is well-written and concise. I was verbally exercising Echo within an hour after opening its box.

The speech synthesizer works much like the Vocoder operator of 1939. It controls a group of switches which it must operate at the right times and in the right order to produce humanlike speech.

Invisible to the user is the Echo's internal software which manages its two modes, Text to Speech and Phoneme.

In speaking from text, the synthesizer must consider nearly 400 rules. Unfortunately, as many frustrated students have noted, English breaks its rules much of the time. To get Echo to say "robot," we spell the word "rowbot"; "typewriter" becomes "type writer."

PHONEME MODE. In phoneme mode, words are coded to produce a steady stream of basic sounds (phonemes). In

this mode, Echo spells its own name EKO. Other codes allow control of inflection, stress, pitch, pitch rate, pause, and volume.

Some editing is required to create easily understood speech from text. However, the synthesizer does surprisingly well at reading text "cold" (i.e., unprepared).

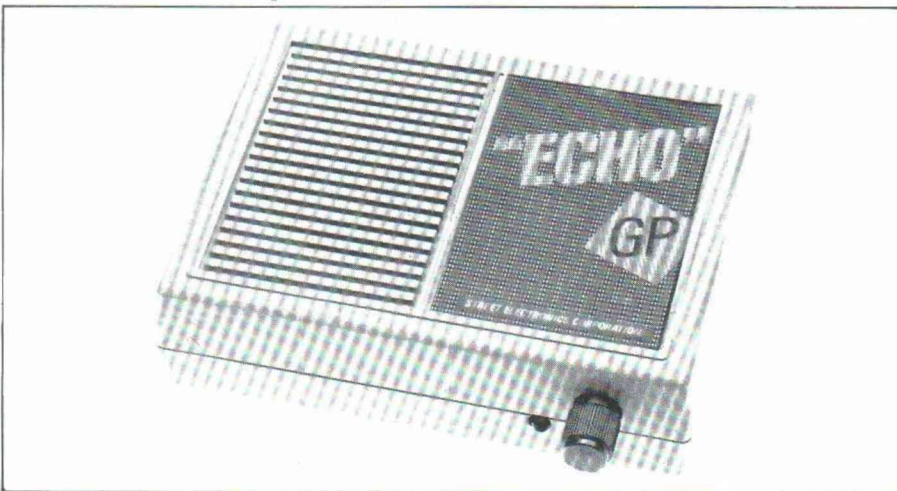
It is fascinating to experiment with the synthesizer and dream up uses for it. One application for Echo is in language study. I soon had the device speaking German and Spanish words by spelling out the sounds. The pronouncing guide in a foreign language phrase book could probably be spoken from text with few changes.

OTHER APPLICATIONS. Another application could be remote operation of a home security system. Echo would be helpful in the darkroom as a timer for critical film development.

Possibly the most exciting field for inexpensive computer speech is in systems for the blind.

How about a verbally outputted spreadsheet program? A word processor for spoken words would be interesting and useful.

Echo, and devices like it, should soon encourage a new type of software: software for the ear. ◀



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Model 100 Cassette, 26-3827
8K (CALC), 16K (BCALC)
\$19.95

By STUART HAWKINSON

In the near future our voracious appetites for Model 100 software will be dulled. Then program developers will have time to concentrate on providing truly outstanding software, where no effort has been spared to create efficient, error-free applications. For the present, however, we must endure "fast food" software.

The Model 100 Calculator program from Radio Shack consists of a useful collection of calculator and financial functions. The two programs in the package provide many of the calcula-

tions you need for financial planning and investment analysis.

The basic calculator program (CALC), only requires 8K RAM, performs the usual arithmetic operations in a calculator-style format. Also included are functions such as square root and logarithms.

BUSINESS CALC. The business calculator (BCALC) runs in 16K RAM and includes all the CALC functions. In addition, it serves as a financial calculator, with a menu of five major categories, each containing two to six options.

The Radio Shack program is offered in an attractive padded jacket containing the cassette tape and convenient operating manual. The manual illustrates each program section with the actual screen formats. It also leads you step-by-step through an example of each function. A small reference pamphlet in the back of the binder gives a summary of the Model 100 file handling and Basic program operations. It serves as a guide to loading, saving, and running Basic applications programs.

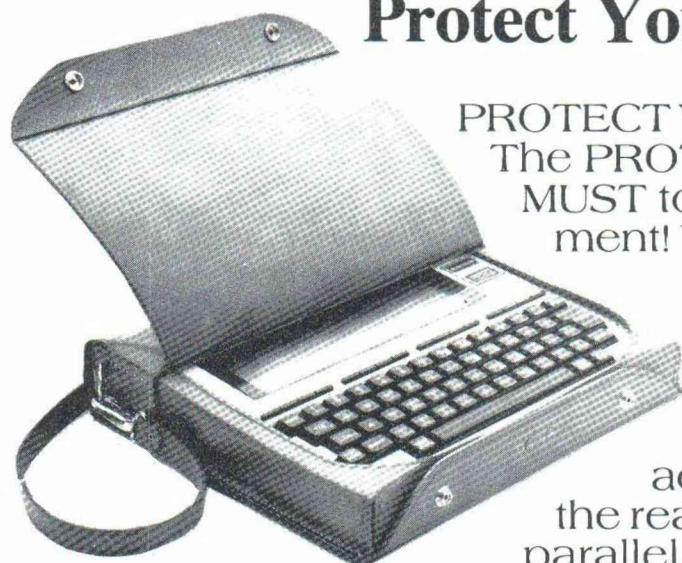
I encountered no problems loading the programs from cassette tape. After loading, the programs may be saved as

RAM files. When selected from the Model 100 file menu, each begins execution by displaying a function-key menu of the more esoteric calculator functions.

Both programs start in the calculator mode. The only difference is that BCALC displays a 'Calc' option which takes you to the financial menus. The calculator mode works in a familiar hand-calculator style. The input values and basic arithmetic operations (add, subtract, multiply, divide, and exponent) are keyed-in normally. The extended functions ($1/x$, $-x$, sqr , x^*x , Log , exp) are selected with the function keys.

NOT ERROR PROOF. Although the calculator mode functions smoothly, it is not error proof. The program checks some inputs, but it doesn't give you the solid feel of an electronic calculator. Holding down a number key will result in repeating number, a frantic error message, and a completely ruined display. You can also enter multiple decimal points (all numbers after the second are ignored). If you press the label key, the menu selections disappear and only return after restarting the program.

CALC traps two of four frequent er-



\$109⁹⁵

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- utilize a host of additional services, including latest news stories, electronic conferencing and much more (**BELLS & WHISTLES**)
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rors: overflow/underflow and divide by zero. (Underflow is only detected in Model 100 Basic during exponentiation.) However, commonly made errors in finding the square root of a negative number, or the log of zero or a negative number, do not produce polite error messages. They simply give the cryptic FC code found in the Model 100 manual.

There is no way to enter numbers into calculations using scientific (exponential) notation. However, numbers are displayed in that notation if they are less than $1.0E-3$ or greater than $1.0E+14$. One serious problem is the lack of control of the significant figures displayed; you are stuck with the default display format provided by Basic. Also, you can't store values in a memory buffer or repeat calculations with constants.

These deficiencies make the calculator program less useful than popular hand-calculators. It may be convenient to have basic calculator functions available in the Model 100 when needed, however.

GET TO BUSINESS. BCALC combines the calculator functions with the business financial options. This program requires 16K RAM to operate. The main menu lists five sub-menus: days and dates, interest, loans, bonds, and futures (savings plans). Each sub-menu then details the calculations performed. For example, days and dates provides options to calculate the day of the week from the mm/dd/yyyy calendar date, calculate the number of days between two dates, or calculate the date in days from the given date.

The financial functions deal with the interest on a transaction, the amount required for a certain investment, or the future value of payments being made. The bonds section, for example, calculates the price of a given bond or its yield at maturity. This latter calculation requires approximately two minutes to complete and the program displays 'Computing ...' to assure you all is not lost in the ether.

The loan and interest sections will calculate various unknown quantities, depending on the information available. You select various sub-menu options rather than having the program fill in the missing information. As with many programs which calculate loan amortization, the exact amount of the

last payment is not calculated. It often differs from the regular payment by a few cents.

PERFORMS WELL. In general, the financial functions in BCALC perform well. The format of data input is consistent between sections, and the outputs are properly formatted dollars and cents, where appropriate. You can return to the next higher menu level by pressing the escape key. This escape isn't given on any but the first menu, but is mentioned repeatedly in the manual. If you return to the calculator mode, your last value is still in the accumulator.

In only a few places in BCALC do you get suspicious results. For example, the 'present worth' of \$1 at 0.5% interest paid in a single installment yields \$10. Pretty good deal, huh?

The programming in the package is very well laid out. The style is clear and crisp. You will be able to learn a number of useful programming techniques by reading the Basic code. Function keys, both ON KEY GOSUB and returned values, error trapping, screen format control, and modular subroutines are all demonstrated.

If you desire a more compact version for day-to-day use and permanent storage in the Model 100, you can alter the Basic programs. I was able to reduce both programs by 45 percent by using some standard space-saving methods. You can use multiple statements, renumber with unit increments starting at zero, use string variables to store common text (like 'payment' and 'interest'), and generally tighten up the logic. These code-saving techniques also make the programs run significantly faster and feel more responsive.

***In a few places
I got suspicious
results.***

ADEQUATE JOB. The Calculator program package does an adequate job of providing most needed financial functions for business and home planning. However, the calculator functions are not up to the professional standard in hand-held calculators. The programs need better error trapping, better in-

put checking, and more display flexibility. Without storage registers or the ability to nest parentheses, many standard calculations are nearly impossible.

After the initial surge of Model 100 programs fills the void of consumer applications, I hope software developers will take the time to produce better programs. We deserve software that matches the excellent hardware design of the Model 100 and the extensive Basic provided in ROM. ◀

TEXT FORMATTER, RENUMBER UTILITY IN THIS PACKAGE

PFORM: Page Formatter for Text and Basic

Discovery Computer Systems
1541 Pennwood Circle
Clearwater, FL 33516
813-581-3041
Minimum RAM: 8K
\$21.95

By STUART HAWKINSON

PFORM is a text formatting program that gives the Model 100 many of the capabilities of a word processor. The program, supplied on tape, complements the excellent text editor already present in the Model 100 ROM. Now you can prepare professional looking documents, business memos, and letters.

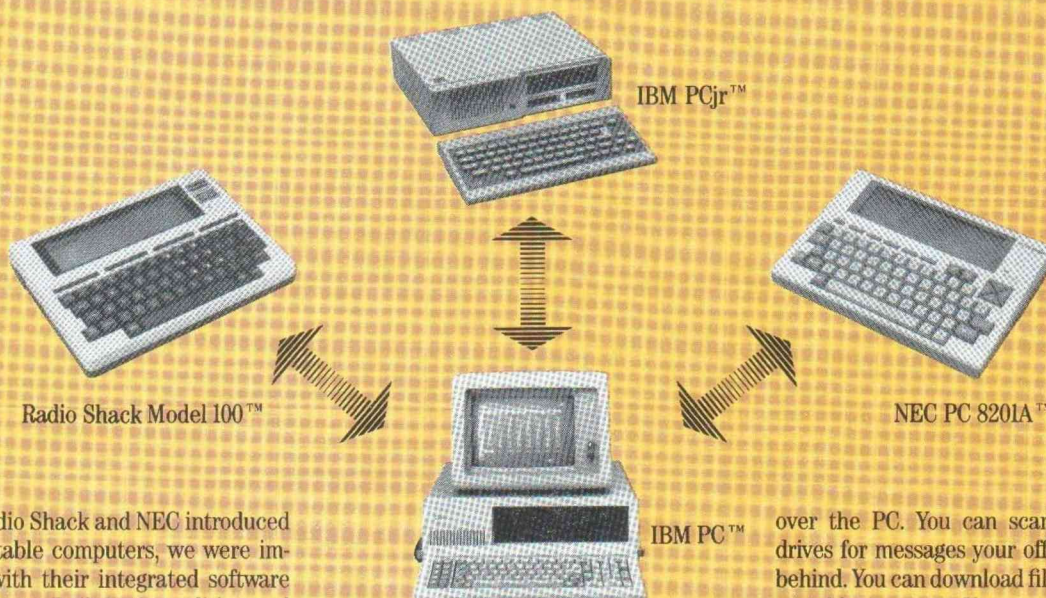
The program provides options to set margins, specify line spacing and line widths, number pages or force new pages, center or indent lines, and select a double-strike font.

It also formats Basic listings. It will print programs with specified line lengths and margins. You can select between normal multiple statement lines or statements printed on separate lines to improve readability.

A BONUS. The cassette tape also contains three bonus programs: RENUM, a Basic renumbering program; DOW, a stock quote retrieval program; and DIXIE, a graphic, musical alarm clock. These programs certainly spice up PFORM and give you a chance to explore some of the Model 100's other features.

The nine-page documentation package describes the operation of the program and leads you through each step of text preparation. It also provides exam-

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ples of printed output to illustrate most of PFORM's options. The "free" programs are described on separate pages.

HEAD PROBLEMS. I had trouble loading the programs from cassette; so I used two different recorders and varied the volume settings over a wide range. Most of the problems seemed to be with the last few records in a program file. After getting a successful load, I immediately made a backup copy on another tape. Those copies loaded normally.

I haven't experienced problems with tapes from other manufacturers, so Discovery Computer Systems may have tape recorder head-alignment problems. I haven't had such difficulty loading tapes since the early days of the TRS-80 Model I.

When you run PFORM, you are presented with a list of the files in memory. This is a great feature! It simplifies selecting the text file to be printed. You can only print ASCII text files (with the .DO extension). This means that Basic programs will have to be saved in the ASCII format. The documentation clearly shows you how to do this.

PRINT PIZAZZ. When printing a Basic program listing, PFORM first leads you through a series of options. You select top and bottom margins, page numbering, line width, left margin (so you can punch the listing for a binder), and output format.

You can also specify double-strike printing, if desired.

The Basic program is listed with a header on each page giving the date and name of the program file.

If a line is too long for the specified line length, the rest wraps around neatly.

A friendly feature of the program is it accepts either upper- or lower-case commands. Programs which specifically require a particular case for input can be very frustrating to operate.

When you select a text file to be printed, you are presented with a similar series of choices. You select margins, line length, line spacing, page numbering, and single- or double-strike printing.

In addition, you can specify indentation (uniformly spaced tabs) and left offset (unindent). These special features are selected by imbedding special characters in the text. You can also specify lines to be centered and page breaks with imbedded characters.

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With these controls, you can format simple letters and memos, as well as technical documents and outlines. The indent features make it possible to emphasize numbered paragraphs, and highlight special sections by offsetting from the normal text.

LIMITATIONS. The only features lacking are the ability to right justify text or print sections flush right (as in some letter-heading formats).

A more sophisticated system might also allow headers and/or footers to be printed on each page.

Since the program was written in Basic, you can modify it to suit your particular printer. My printer is set up to skip over page perforations. This entails using a 60-line page, rather than the usual 66-line format. To change the value in PFORM, simply edit the value in line 120.

MODIFICATIONS. If your printer uses different codes for double-strike or emphasized printing, you can change the codes used in lines 240 (select font) and line 260 (clear selection). The program only prints a single uniform font, so you can't select a special font for just a word or two.

The program can be shortened to conserve precious memory space by removing the initial sign-on message and some unnecessary spaces.

You can also renumber the program, using small line number increments. The RENUM program can be used for this purpose. It will renumber Basic programs that have been saved in the ASCII format.

The program will handle statements containing GOTO, GOSUB, THEN, ELSE, RESTORE, and RESUME commands. You can't renumber multiple ON-GOTO or ON-GOSUB statements, however. RENUM also has problems with very long lines, and can't remember lines with numbers larger than 32767. Despite these limitations, the RENUM program will go a long way towards getting your programs cleaned up. As a bonus program, it's obviously worth the price.

DOW AND DIXIE. The other two programs in the package illustrate some of the Model 100's unique capabilities.

The DOW program is designed to retrieve quotes from the Dow Jones Information Service. It will call at a pre-programmed time, and sign on using

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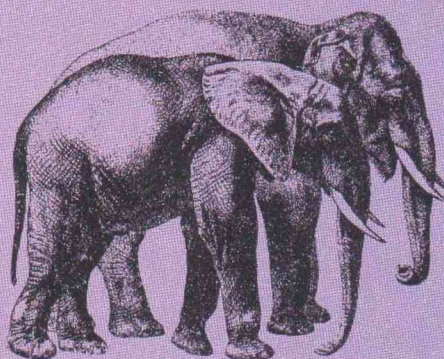
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your password. It then asks for the quotes you want, saves them to a file, and signs off.

The DIXIE program serves as a novel alarm clock. At a specified time, the program draws a rendition of the Confederate flag and plays a couple of verses of "Dixie."

The PFORM package provides a number of interesting Model 100 applications. The text formatter is capable of producing a good-looking presentation. It won't rival a full featured word-processor, but it certainly adds new dimensions to the Model 100. The other programs supplied with PFORM make novel uses of the 100 and utilize many of its capabilities. PFORM is a welcome companion to the Model 100 text editor. ◀

CALENDAR PROGRAM MAKES DAYS COUNT —SOMETIMES

Executive Calendar version 1.0

Radio Shack Catalog No. 26-3833

Tandy Corporation

1500 1 Tandy Center

Ft. Worth, TX 76102

Minimum of 24K required

(32K preferred)

\$19.95

By MARY JEANN BATHAM

Executive Calendar is two programs in one:

- A calendar program to manage time

and appointments; and

- A dates program to calculate the days between dates and list floating holidays.

The software is neatly packaged in a padded binder with a well-written instruction manual and two, small quick-reference booklets which fit in a pocket at the back of the binder.

No loading instructions were given in the manual, but the "applications quick reference" booklet gave detailed step-by-step instructions on loading from tape.

SOUND OFF. Both programs loaded immediately from my Minisette-9 tape recorder, with volume setting 5. The booklet suggested that if problems are encountered loading the tape, go into Basic, type SOUND OFF, and press enter. This is an excellent suggestion and one I'll use in the future.

The mini-instruction booklet told me to load the program by typing CLOAD, the name of the program file, and pressing enter. But it didn't tell me the name of the programs. The cassette tape label showed "dates" and "calndr," but I managed to load both programs using CLOAD without a file name.

Otherwise, this booklet gave a fine summary of loading and saving Basic, document, and machine-language files, and its 4-inch-by-6-inch size is handy when traveling with the Model 100.

CALENDAR. The calendar program is 14.5K bytes long and the dates program consumed 10K. If you have only 24K of memory, you'll be unable to

have both programs in memory at the same time.

The instructions caution you not to exit the program by pressing shift-break. I did and found the function keys in Basic changed. The next time I ran Calendar, I exited properly using function key 8 and everything worked correctly.

TIME MACHINE. The function keys are clearly defined in the manual:

- F1 displays the previous month's calendar;
- F2 displays next month's calendar;
- F3 displays the calendar for any month and any year from January 0001 to December 9999;
- F4 displays the week's activities;
- F5 shows the day's appointments;
- F6 saves the calendar as a NOTE.DOC file in RAM; and
- F7 writes the calendar to tape and returns to the main menu.

After selecting a month and year, you can display your week's appointments. The days are divided into 30-minute segments from midnight to midnight. Appointments are marked with an asterisk (see figure 1).

When viewing a day's appointments (see figure 2), you're limited to 14. In this mode you may use a submenu letting you add an appointment, edit a schedule, remove a schedule, or return to the main menu.

When adding an appointment, you must use the 24-hour clock. And the program requires insertion of a colon

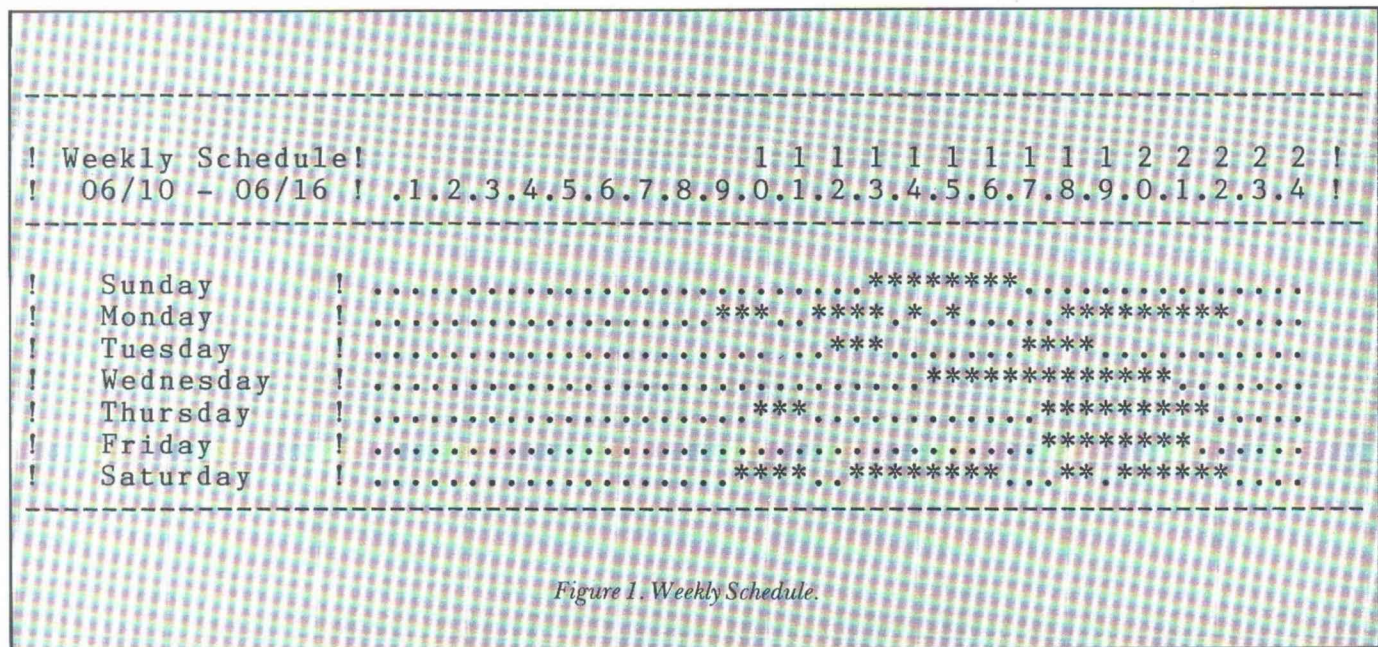
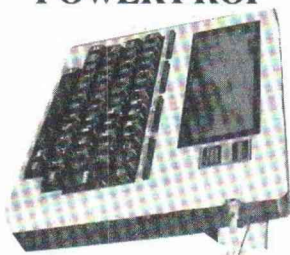


Figure 1. Weekly Schedule.

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REVIEWS

Figure 2. Daily Schedule.
 Daily Schedule for 06/11

Time	Dura	Description
09:00	01:00	dentist appointment
10:00	00:30	job interview Pat K.
11:30	00:30	job interview Mary M.
12:00	01:30	Irene birthday lunch
14:00	00:30	job interview Nancy G.
15:00	00:30	job interview Bruce B.
18:00	04:30	dinner with John

between hours and minutes. I found this annoying since the machine kept beeping until I found the colon key. Perhaps the authors could have written a short routine that would automatically add the colon.

SOCIAL SUSPENSE. I also had to enter the length of my appointment (called "duration" in the program). This would be practical if I were interviewing prospective employees for a job opening, but I plan to use the calendar program to keep track of social activities, too.

Somehow "duration" takes the mystery out of my social life, and I resent having to figure out beforehand what time I send a date out the door.

I also was surprised I could enter a two-digit hour for duration time. How many of us schedule an appointment 10 or 12 hours?

I was given only 21 letters to describe my activity. If I had a trade show at the Holiday Inn on State Street in Hayfield, IA, I'd have to abbreviate it to "tradeshowH1StageHayIA." I wonder if, weeks from today when I saw that appointment, I'd remember what it meant.

I also had the option of editing my appointments. If you position the cursor over the time and wait long enough, you can also edit time and duration, too. (The manual didn't point out this nifty feature.) However, if you do that, you'll have two listings for the same date; so you'll have to remove one of the entries. This edit feature was very confusing and should have been explained in more detail in the manual.

The software authors could have saved some memory length by using a few tricks. Multiple statements could have been placed on the same line, saving three bytes for every extra line number eliminated.

Also, I'm not certain how many times I need a calendar for 1776 or the year 1999, so some of the data for other centuries could have been eliminated.

DATES. When the dates program is run, this menu appears:

- (1) conversions
- (2) holidays
- (3) weekdays
- (8) menu

Conversions converts Gregorian calendar dates to Julian days. I quickly got out of that program. Somebody out there must have a use for it, but I don't.

Holidays was more practical — and interesting.

It's nice to know when Easter, Memorial Day, President's Day, Labor Day, Father's and Mother's Day, Election Day, and Thanksgiving fall for future years.

I could also find out when the First Sunday in Lent, Passion Sunday, Palm Sunday, Good Friday, Ascension Day, Pentecost and Trinity Sunday fall each year. If I were a member of the clergy, I would probably find these holidays very useful. However, I would rather know when the Jewish floating holidays fall, like Yom Kippur or Passover, in case I were making sales calls on those religious days.

In this mode, you may also display the date in any year for a holiday. I moved the cursor to Election Day, hit F3, typed in 1985 when prompted with "which year," and the screen displayed Tuesday, Nov. 5th, 1985.

FIND. The find function allows you to specify a given date to see if a holiday falls on it. I positioned the cursor over Thanksgiving, pressed F5, and typed in 12/25/1984. The program flashed for all years from 1984 to 2084, and finally told me that Thanksgiving Day does not fall on 12/25.

The weekdays function allows the calculation of the number of days between two dates. When I tried to calculate how many weekdays fall between Sundays, the program kept coming back with six weekdays. (Wish I could

get my staff to work that extra weekday without overtime pay.)

When Tandy decides to revise this software, they might want to start on this routine first. It would be so much more useful if it worked.

This function is also supposed to calculate the number of times a day falls between two dates. I tested the program to see how many Mondays fall between this Sunday and the next Sunday. The program figured two. When I tested it again, trying to calculate how many Mondays fall between a Sunday this month and a Sunday next month, it advised there were minus 51. Oh well. Mondays are always bad days anyway.

Features in this function that *do* work include:

- Finding the nth occurrence of a day of the week in a given year;
- Calculating the number of years a specific day of the week falls on a certain date; and
- Calculating nine days that a specific day of the week falls, after a starting date. For example, I chose Sunday and the program listed the next nine Sunday dates for me.

The Executive Calendar is a very useful program, subject to a few minor limitations. The "holiday" function of "dates" is useful, but more practical holidays should be added. And the bugs need to be worked out of the "weekday" and "number of times" portions of the program. The price is reasonable, and the two small booklets are excellent reference material for Model 100 users. ◀

THE GROUP FROM DALLAS DOES IT AGAIN WITH TENKY

Tenky+

Portable Computer Support Group
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\$59.95

By ROBERT K. KAWARATANI

Portable Computer Support Group (PCSG) is one of the leading third party software vendors supporting the Model 100. Hot on the heels of its highly successful Businesspak+ (see

Portable 100, September 1983, page 54; October 1983, page 17; November 1983, page 54; January 1984, page 58), PCSG has introduced five new business programs for the 100, including a financial calculation package called Tenky+.

The name of the package comes from the 10-key numeric keypad incorporated in the keyboard of the Model 100, which gives it the capability of performing a wide variety of financial functions. The package includes an instruction manual and cassette (housed in a three-ring notebook), as well as six stickers to apply to keys, designating their special functions within the program.

TWO-MODE OPERATION. The program is in two modes: tape and analyst. The tape mode, referred to as the "dynamic tape", is located on the right side of the display. It works much like a desktop calculator, "scrolling" the entered values up the screen. You can store up to 120 tape entries, including related notes that don't exceed 26-characters per line. Each of these tape positions functions as a calculator, allowing chain calculations and nested parentheses.

Eight numeric entries are visible at any given time, although you can only view the last note entered. The dynamic tape allows for editing of both the numeric and note entries, and performs a variety of tasks including addition, subtraction, multiplication, division, reciprocals, changing sign, natural logs, antilogs, and percents. Additionally, it permits you to have up to 10 levels of parenthesis open at one time.

The contents of the dynamic tape can be saved to RAM, cassette, or printed. Conversely, stored files can be loaded from RAM or tape files. Tape entries also may be saved to the analyst mode registers, located at the left and center of the screen.

ANALYST. This mode converts the Model 100 into a sophisticated financial calculator, allowing "what if" calculations with just a few key strokes. The 10 analyst registers make it possible to perform amortization schedules, break-even analysis, compound interest (annuity) calculations, internal rate of return, modified internal rate of return, and net present value.

It sounds pretty versatile, but let's put it to the test. I've chosen to use an example from the manual for problem solving with an unknown value. The

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A picture is worth a thousand words. Now you can produce color graphs of professional quality effortlessly in minutes wherever you go. Plot tabulated data or functions. Choose from line graphs, scatter plots, bar graphs and more. Axes are automatically scaled and labelled. A few keystrokes select from many options, such as plot size, continuous curves and/or separate marks, multiple curves, optional grid overlay, linear or log plots, numeric integration or differentiation. . . A label-maker program lets you add fancy titles or legends. **AUTO PLOT** is written in BASIC and comes on cassette, together with an exceptionally clear 28-page manual.

Why such a small ad for such a fantastic program? By keeping down our overhead, we can offer you **AUTO PLOT** at the unheard-of introductory price of \$49.50

Also available:

AUTO PLOT for TRS-80 Model I/III (48k, 1 disk and CGP-115)...\$69.50

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AUTO PLOT for LN-W80 (+ Hi-Res video graphics)...\$99.50

Please add \$3.00 for shipping and handling CA residents please add sales tax. Phone orders, VISA and MASTERCARD welcome.

MENLO SYSTEMS

3790 El Camino Real, Suite 221
Palo Alto, CA 94306, Tel (415) 856-0727

TRS-80, CGP-115 TM of Tandy Corp

problem: If one were to borrow \$8500 from a bank for a new car at 17.5 percent APR, paid over a 48-month period, what would the monthly payments be?

The interest rate is entered into register 5 (17.5 divided by 12), the principal is entered into register 7, and the number of payments is entered into register 9. The cursor is placed over register 6 and the payment amount (\$247.47) appears in the register. Simple, right?

You can easily perform a "what if" calculation on the problem by changing the amount of payments from 48 to 60. Simply move the cursor to register 9, press F6, and the new monthly payment (\$213.54) appears.

CHILD'S PLAY. Tenky+ actually is easier than a spreadsheet for interest and annuity calculations because any of the values can be varied and the unknown value selected simply by moving the cursor around the screen. Altering the variable being solved in a spreadsheet requires redoing the formulas.

Printing a formatted amortization schedule is elementary. The note option in the tape mode is used to enter a heading for the amortization schedule. Values for interest rate, principal, and number of payments are used to compute the payment value.

F5 is then pressed and prompts for month of first payment, first year to print, and last year to print. Enter is pressed one additional time with the printer connected, and the formatted amortization schedule is printed. Break-even analyses and calculation of internal rate of return and modified internal rate of return are also easy to perform.

The tutorial section of the manual provides step-by-step instructions for operation of the programs, as well as examples of the various functions. The manual would have been enhanced by visual aids, particularly for explaining the location of the registers in the analyst mode. I had to do a little exploring before I found them at the bottom center of the screen.

TYPOS OR BUGS? Also, it wasn't possible to confirm whether disagreements between the supposed and actual results in working through examples of break even, internal rate of return, and modified internal rate of return in the manual were typos or pro-

gram errors, as the specific formulas for using these functions weren't explained.

Although the manual does explain some of the calculations the program performs, it isn't a substitute for a book on financial calculations, nor does it pretend to be. It would be advisable to have a copy of the book recommended by the manual, or an equivalent, for the user with a limited financial background.

PCSG DOES IT AGAIN. While not a frequent user of the types of calculations this program is designed to perform, the user interface and convenience of this program follows in the best tradition of PCSG's previous products. ◀

POWER FROM THE LAND OF A THOUSAND LAKES

Prairie Power

Bluestem Productions
Box 334
Wayzata, MN 55391
612-471-7795

By ROBERT L. GREEN

Being the proud owner of a Model 100, I felt freed from the constraints of power cords and wall outlets. However, this feeling was short-lived. I learned too soon that batteries run down and have to be replaced. Batteries also leak.

Enter Prairie Power, the family of rechargeable batteries from Bluestem Productions (see table 1).

Bluestem's offering seemed like a fair one. I easily could save the original purchase price of batteries over the life of one rechargeable battery. My order, with personal check, was received by them March 2, and the product arrived by mail March 21.

NICELY PACKAGED. The box contained the battery, versatile connecting cable, electrical adapter, and one page of instructions.

The instructions give clear warnings: how to connect, use, charge, and store the battery (which is a lead-lead dioxide electrochemical system packaged in a spill-proof container with two well-marked electrodes — positive and negative).

The battery I purchased was the 8 ampere, 6-inch-by-3.75-inch-by-2.25-inch model. It weighs more than my 100!

Thanks to this battery, I now have use of four slightly-used AA batteries. I also have no need for the Radio Shack AC adapter.

Prairie Power provided a super AC adapter. It has selectable 110–120 and 220–240 VAC options, plus variable voltage output of 3, 4.5, 6, 9, and 12 volts. There's a selector for negative and positive polarity. The \$10.95 price tag for such versatility is a bargain.

STAY CONNECTED. Local Radio Shack personnel told me taking out the four batteries wouldn't affect the memory, and it didn't. They also told me the 100 needs recharging of the internal nicad battery or the RAMs would go blank and lose memory.

As the portable battery also needs to be used and recharged to prolong its life, this was an easy arrangement. I now have the units connected most of the time except when I carry the Radio Shack computer case. (The side attachment from the battery might be damaged by the side of the carrying case.)

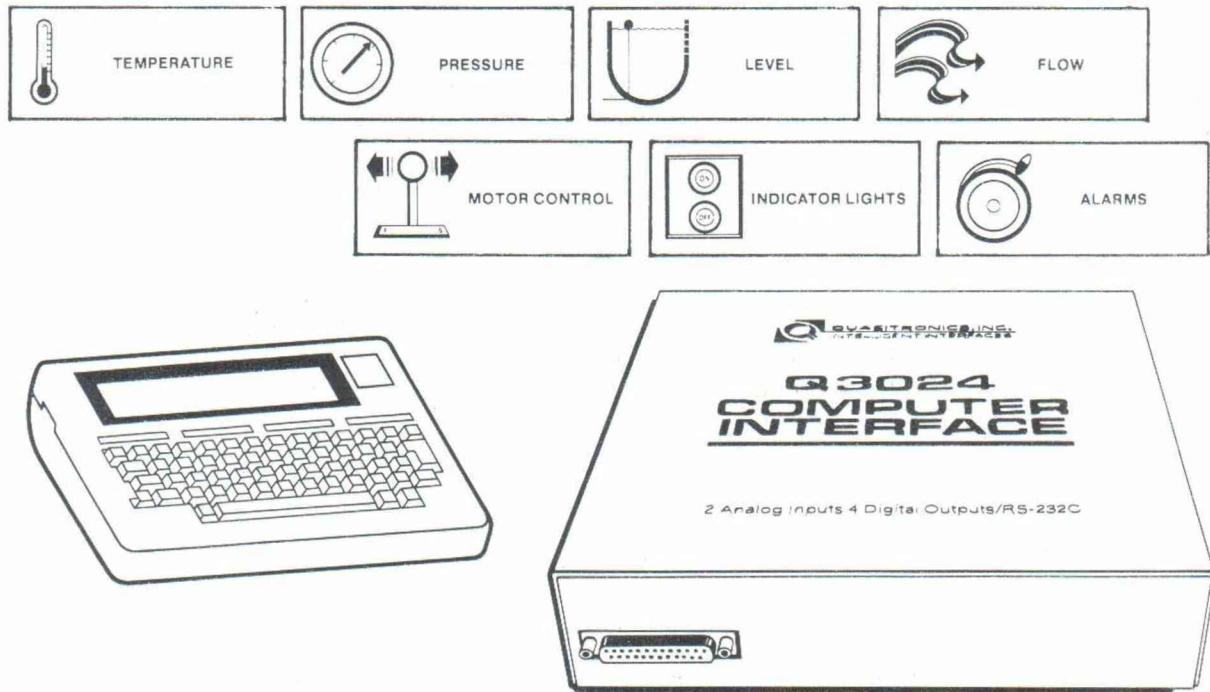
The carrying case has doubled in weight and is packed with: printer cable, telephone connector cables, Model 100, reference manual, portable battery, and adapter/charger unit.

ROUND-THE-CLOCK MOBILITY. Now I easily can go anywhere and not worry about the battery indicator light. I'm not relegated to sitting next to an electrical outlet for my AC adapter, and

UNITS	PRICES	HOURS OF USE	RECHARGE
8 amp. Hr	\$34.95	150–160	48 Hours
5.5 amp. Hr	\$29.95	90–105	24 Hours
2.6 amp. Hr	\$21.95	50	12 Hours

Table 1. *Prairie Power Vital Statistics.*

Make your Model 100 Grow... with the Q-3024 Interface from Quasitronics



For less than \$500* you can add this proven interface unit and expand your Model 100's capabilities. Now you can use it for data collection and to control and actuate alarms, motors, pumps, heaters, laboratory apparatus and a host of other equipment. Hundreds of these quality interfaces have been in use for over a year with documented results.

Take a good close look at this combination of performance benefits.

- Easy to connect to any computer with an RS232 serial port.
- Can be programmed through Model 100 in BASIC.
- Contains a Z-80 micro.
- Can store information on discs to permit long-term data logging (or it can print out).
- Provides 2 high resolution analog inputs; 4 digital outputs.
- Can rescale information into engineering units for your own programming.
- Can control up to 4 devices such as alarms and actuators.

- Sample software examples included on disc.
- Compact—only 8 $\frac{3}{8}$ " x 8 $\frac{3}{8}$ " x 2".

And there's more!

Quasitronics has specialized in interfaces for over a decade. The Q-3024 is just the first in a new and complete line of state-of-the-art interfaces. It's ready now for immediate shipment from stock.

We'll be adding other interfaces soon. If you'd like to learn more about Quasitronics, the Q-3024, and our expanding line of interfaces, call Chuck Jones, collect, or write to the address below. Dealer inquiries are most welcome.

*List price \$495.00 each (plus shipping). Quantity discounts available.



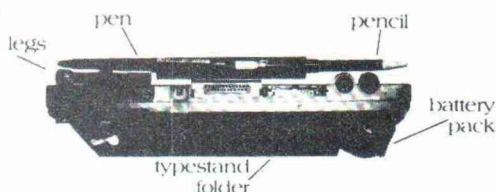
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13 Power Packed Programs Model 100 (8K +)

BUSINESS

Mailing List — Prints on labels, creates ADRS.DO files works with ADDRESS program

Calculator — 16 digit accuracy, has a %, square root and memory functions

Loan Payment Calculator — Gives total

GAMES

Yahtze — Fashioned after the popular dice game, built in score (1 to 3 players)

Yahtze Score Card Generator — Prints score cards for Yahtze (printer required)

Jotto — Use your logic and skills to guess the correct word (1 to 2 players)

Bingo — Calls random bingo numbers

Boggl'e — Fashioned after the popular dice game (1 to 4 players)

Charades — Has a timer (For 2 teams)

EDUCATION

Vocabulary — Allows creation and testing of words and their definitions (uses RAM files for storage)

Spelling Practice — Drills students on a list of spelling words (uses RAM files)

Math Practice — Drills students on + - and ×, with 3 levels of difficulty

PRICE — \$24.95

Less than \$2.00 per program/Instructions

Please add \$2.00 for shipping & handling

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814-764-5158

don't need to keep a set of batteries handy for emergencies. Bluestem advertises batteries used three hours a day can cost \$188 per year.

I'm concerned, though, about how to tell when the Praire Power battery eventually does run low. Recharging time seemed long for a fully-discharged battery (48 hours). With AA batteries, my 32K unit would run only 19 to 20 hours continuously and would retain memory for eight days with power off.

My 100 now can be operated 24 hours a day for 6.25 to 6.75 days, which translates into over a month of four-hour-per-day operation.

REVISION COMING. Bluestem didn't include what voltage level should be set on the charging unit for recharging the 8 ampere unit, nor was anything mentioned about removal of the AA batteries. A call to Minnesota revealed a revised instruction sheet soon will be available with that information. They said they'd call me back as to the proper voltage setting (which I assume would be six for the 6-volt battery).

As with any new company, how long the product holds up in the field, cost, time for repairs, and survival of the company are all speculative. But for \$49...

ALMOST A TEN. On a rating scale from one to 10, I'd certainly give this product a 9.5. It's worth the price and the company offers, at no extra charge, a one-year warranty. This certainly fills me with confidence as to the quality of the batteries and longevity of Bluestem. ◀

YORK SOFTWARE WILL MAKE YOU FINANCE WIZARD

Financial Analysis Packages

York Software

2885 Tanglefoot Lane #8

Bettendorf, IA 52722

319-322-5715

8K and 16K versions available

\$39 total package

By CHARLEY FREIBERG

York Software's Financial Analysis program is a menu-driven collection of programs that includes: amorti-

zation, compound interest, annuities, and bonds analysis. The programs are provided in 8K and 16K versions.

None of the programs were a problem to load, save, or run. The menu-driven aspect is well done, using function keys to switch back and forth between different programs and the main menu. While working on any routine, you can press F8 to return to the previous menu screen.

CONTENTS. The amortization program allows you to determine equal payment amounts, original balances, number of payments, and interest rates. The compound interest program determines future and present values and equivalent rates. The annuities application determines ending and deposit amounts. The final program, the bonds routine, determines yield and purchase amounts.

I tested the different routines and established they do work and work in the manner intended. For example, I checked the payment amount of the amortization routine by entering \$34000 for the principle amount, 10 percent for the annual interest rate, and 300 payments to begin December 1983 on a monthly basis. Having checked the results against what my banker told me, I can verify the math routines in the program.

I checked the other routines and verified the answers against results from financial counselors. I also checked the time it took to figure payment number 300 payment: 46 seconds.

VERSION 2.0. This version produces a flashing "wait" which reassures you you haven't lost your data, program, or patience. But be prepared to wait.

A previous version gave me problems on data entry. Version 2.0 offers easier data entry, with latitude for fumbling fingers, missed entries, zeroes in the wrong place, and other common mistakes. The up arrow is used to delete an entry so clean up is a simple task.

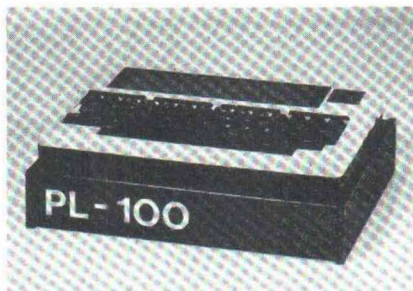
There's now a printing routine to print out an amortization schedule. You have to give the program simple printer information on request, though, before you receive your hard copy.

TRUE TO ITS WORD. The Financial Analysis program does what it should, and more importantly, what it says it will do. ◀

Circle No. 66 on Reader Service Card

EXPANSION TO GO

Battery powered interface for the Model 100. Gives Analog and Digital I/O capabilities to your Radio Shack or NEC portable. Whether in the lab or in the field, Data Acquisition and Process Control are now more affordable than ever. Easy to program using BASIC input and output statements.



Complete PL-100 System \$498 includes:

- Expansion Chassis (holds 3 boards)
- Combination I/O board with
 - 16 Channel 8 Bit Analog Input
 - 4 Channel 8 Bit Analog Output
 - 4 Analog Level Sense Inputs
 - 16 Bits Digital Output
 - 16 Bits Digital Input
- Battery Charger / AC Adapter
- 2 Empty expansion slots

- Uses rechargeable batteries and provides power to the Model 100
- Expansion boards available:
 - High Accuracy 12 Bit Analog I/O
 - 16 Bit Digital I/O
 - Combination Analog & Digital I/O

ELEXOR ASSOCIATES

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Circle No. 67 on Reader Service Card

SISTER DRIVES BROTHER

Maybe you've seen the incredible new Brother EP-44 printer — a battery powered correspondence quality printer just about the same size and weight as your TRS Model 100. Or maybe you already own its predecessor, the EP-22. These are the perfect portable companions to the Model 100, but...

The usual printing and formatting programs won't drive these Brother printers properly, because of timing and overflow problems, and because of their reliance on printer control characters which the EP printers don't respond to. However...

We at Bullet-Proof Software have developed a tailor-made program, SISTER.BA, for formatting text and driving the Brother EP-44 or EP-22 from the TRS-100. It formats .DO document made in TEXT mode and prints a beautiful copy. No more need to "configure" a generalized format/print program that is not geared or really suited to the exact printer you have, or to struggle with confusing parameters — just load and run and print a perfect document first time. NEC PC-8201 versions are also available.

We think this program is the most comprehensive text formatter/printer yet made for the lap computer market. It has facilities not found even on many full-blown full-price dedicated word processors. Partial feature list: dynamic margins and line spacing and automatic right justification, conditional and unconditional page end with optional page-number gap,

line numbering, underlining, overstriking (for lawyers), centering, right-flushing, paragraph indenting, superscript/subscript, special characters, composite characters (by backspace), soft-hyphen, hard-hyphen, automatic/manual hyphen, required space, word and line counting, alternating-side headers/footers, continuous print from roll paper with optional page throws or stopping for paper tearoff, multiple copies, recover on printer fault, skip through document, automatic dating, default-parameter setting, merge from variables-document (for repetitive letters) or keyboard, print from cassette, stop/interrupt, full vertical margination, headers and footers available together, date and page number in header/footer, starting page number settable, and optional page legend omission on first page (for headed paper).

PS: You won't be happy with this complex program if your machine has less than 24K. But, we intend to produce a ROM version soon! Watch this space, but don't hold your breath — full trade-in on the cassette version will be given. By the way, you can change the name of the program once it's loaded if you don't like it!

((please supplement ordering information)) PRICE \$60 (plus %% for credit cards)
(ask customers to specify EP-22 or EP-44, TRS or NEC)

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NEW PRODUCTS



ANALOG TO DIGITAL DEVICE FROM N.J. FIRM

Measure analog voltages with 1 millivolt resolution with Humphrey Instruments' Model 100 A/D. The unit will accept digital data byte-by-byte, output single bytes of digital information, or shake hands with external analog or digital devices.

The A/D accepts up to 16 0 to +4.095 volt inputs at a terminal strip on the front panel and provides 12-bit output data from the integrating A/D converter. Also available at these terminals are +15 volts, -15 volts, and a +1.22 volt potential.

The precision unit comes with logging and test software on cassette, a manual including program listings, a 40-pin ribbon cable for direct connection to the 100 buffered bus, and a plug-in power supply, all for \$580. Contact Humphrey Instruments Inc., 35 Cold Soil Rd., Lawrenceville, NJ 08648, 609-896-1612.

SURVIVAL KIT FOR PORTABILITY AND PRODUCTIVITY

If you're one of those individuals constantly thwarted by losing your pen, and fumbling with dislocated 100 prop legs, perhaps Workstation-100 is the answer.

The kit includes seven items: support legs (\$3.50), pen (\$2.75), mechanical pencil (\$1.75), case for extra batteries (\$3.95), and a clip-folder/typing stand (\$6.50). The compact kit is designed so all items attach/detach using velcro while allowing the computer to still be stored in either the original carrying case or the Radio Shack briefcase.

Save \$3.50 by ordering the complete kit for \$14.95.

Orders may be placed by calling 804-794-6675 with your charge card, or by writing A.R.M.S., 12131 Old Buckingham Rd., Midlothian, VA 23113.

LET TYPESETTING EQUIPMENT TALK TO MODEL 100

This new software program makes the 100 totally compatible with any system capable of receiving data from a Compugraphic MDT 350 terminal. Requiring few keystrokes at the 100, the MDT Communicator lets the user select either the acoustic coupler or RS232 communication ports for data transmission. When using the RS232, 300 or 1200 baud rates may be selected.

The software with the 100 can be used in plant or remote. It'll transmit formats, text files, typesetting commands, and translation tables. The

MDT Communicator package is \$495; a complete Model 100 package is offered at \$2495. For more information, contact Gary Porter, 603-424-4161, or write to Switch & Mux Inc., 10 Oakridge Ave., Merrimack, NH 03054.

BATTERY-POWERED DEVICE STORES RAM ON THE ROAD

Cryptronics Inc., a Fountain Valley, CA, manufacturer of computer peripherals has developed a portable RAM-disk for the 100, NEC, and Olivetti M10.

Weighing in at 3.75-pounds (about half the size of the 100), the PortaPac 100 stores 60K of programs and data, expandable to 252K, and provides two days of storage between charges. The built-in proprietary operating system stores information in RAM exactly the same way the 100 does, making data-access almost instantaneous.

PortaPac connects to computers via



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Manuscripts, Reports, Proposals, Newsletters, Personalized Letters

- Columns with decimal alignment
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 - MULTIPLE OVERLAPPED ADDRESS LISTS
 - ENVELOPE & LABELS
 - ATTENTION LINE

CENTERING

OR LEFT

RIGHT JUSTIFIED,
and RIGHT ON THE *same* line!

- CHARACTER STYLES (superscript, subscript, underline, compressed, italic, expanded... or whatever your printer will produce) pre-defined to single character controls for on/off operation.

MIXED CHARACTER *STYLES* ON THE SAME LINE while maintaining even margins!

- JUSTIFIED MARGINS
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- PAGE BREAKS, SIZE AND LENGTH
- DRAFT or FINAL QUALITY
- MULTIPLE COPIES
- Pass-through control for special printer codes
- INCLUDING OTHER FILES
- TAB WIDTH AND MARGIN CONTROL
- HEADING AND PAGE NUMBERING
- CONTINUOUS or LETTERHEAD
- CR/LF option

Program size 8k; in BASIC. Price \$69.95; California residents add 6% or 6.5% sales tax as applicable. Price includes cassette, 12 page user guide and shipping. Specify printer type and model when ordering. For other than EPSON, GEMINI, RADIO SHACK printers, enclose copy of control code summary with 5 character styles preferred. To order, send check or money order to:

TARGET SYSTEMS
BOX 507, PACIFIC GROVE, CA 93950
408-646-1547

¹ May be superscript, numbers, letters, or symbols.

the RS232 interface port, allowing easy data-transfer between portables and desktops. The \$395 unit works with all CP/M and MS-DOS microcomputers.

Contact Cryptronics Inc., 11711 Coley River Circle No.7, Fountain Valley, CA 92708, 714-540-1174.

PORTABLE POWER SUPPLY SAVES ON BATTERY COSTS

Power Prop brings freedom to 100 users, allowing you more time away from an AC source. A totally portable power supply, it uses D size batteries which last longer than AA size batteries.

Power Prop sells for \$12.95 each, three or more at \$9.95 each; add \$2.50 for postage and handling. For more information, contact Wagoner Innovations, P.O. Box 330, Ooltewah, TN 37363.

INFO-MATE MAGIC OFFERS AUTO-DIAL MODEM

Easy installation, intelligent features, and reliable data communications are how Cermetek Microelectronics Inc. sum up their modem, Info-Mate 212A. It's a microprocessor-based Bell 212A-type that fits beneath your telephone.

By plugging the modem into the data terminal or computer, the telephone line, and a power outlet, you're ready to go. It automatically adapts to the host's communication parameters, eliminating system integration prob-

lems that often arise. Features are: auto-dial, auto-answer, auto-speed select, auto-parity select, and auto or manual selection of pulse or tone dialing.

Priced at \$595 for a single unit, Info-Mate is available directly from Cermetek Microelectronics, Inc., 1308 Borregas Ave., Sunnyvale, CA 94089 or from one of their dealers.

TEXT FORMATTER FOR COMPUTER ILLITERATE MIND

Wow'em with this slick print formatter: Lone Writer, by The Great Oak Company, promises professional-looking business letters or ad layouts with a minimum of effort. Developed with the computer-illiterate in mind, all that's needed is the insertion of a couple of "common sense" format

and font control commands. Often no commands are needed at all, the default settings do the job.

The software works with any printer compatible with the 100 and Nec 8201. With a dot-matrix printer, Lone Writer gives you up to 16 different fonts and options such as underlining, subscript, and superscript.

Interested readers may contact The Great Oak Company, 7 East 14th St., Suite 1530, New York, NY 10003.

SOFTWARE OFFERED FOR IBM-100 LINKUP

The missing link between the 100 and the office IBM PC has been discovered: 1-to-1 Remote Control software from Kensington Microware.



MODEL 100 SIG ON COMPU SERVE

Log on to
the MODEL 100
Special Interest Group
on CompuServe and
gain access to more
than 400 FREE programs!

Spreadsheets,
Printing, Diaries,
Utilities, Programing,
Formatters, and more! Just
log on CompuServe and
GO PCS-154 at the prompt.

Remote Control works at the office, on the road, and during meetings by integrating word processing and communications. Modeled after the software in the 100 and NEC, the command structure is identical. You can

move files at high speed over a standard RS232 cable between the 100 and PC; a null-modem cable is included. Users also can communicate and control unattended PCs over telephone lines from their 100 keyboards.

Remote Control, for \$180, can be ordered directly by calling 212-475-5200.

FIVE GAMES FOR 100 TEST FUN CAPACITY

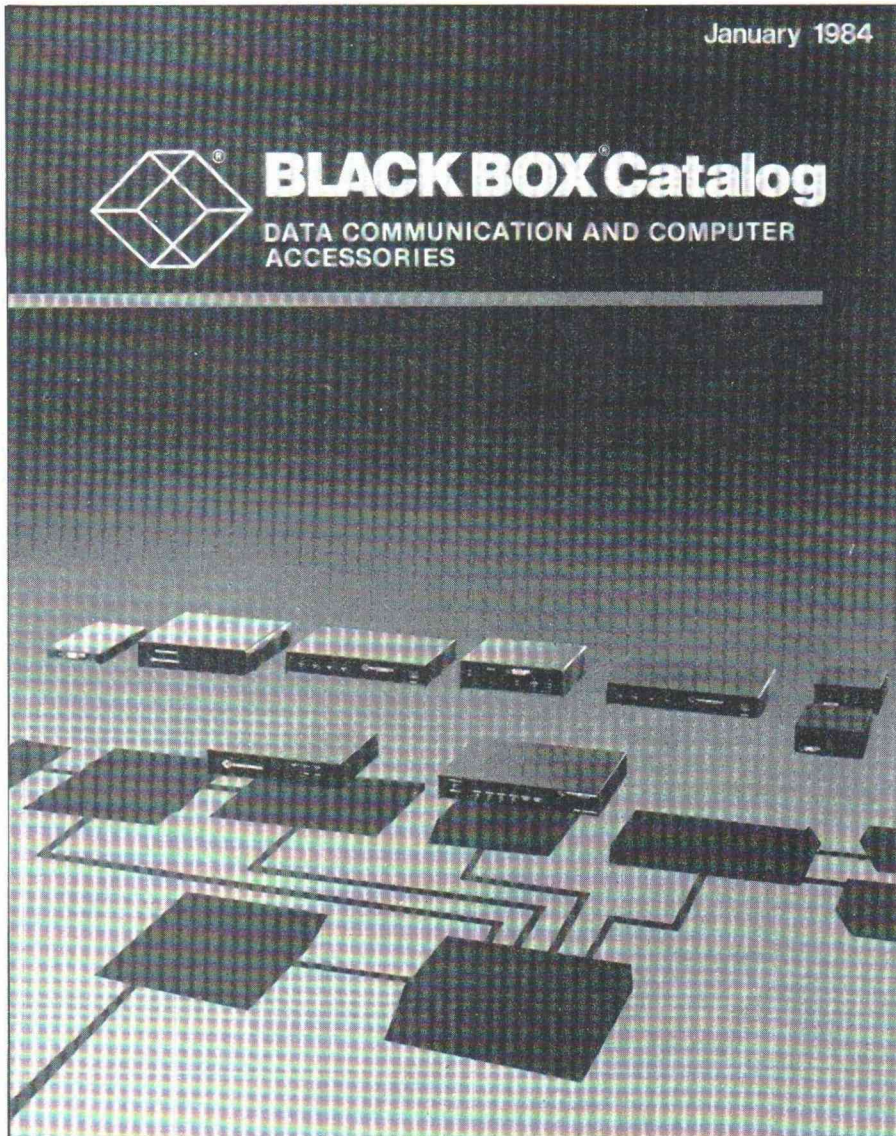
And for those of you still looking for more computer fun, five games have made their debut from Micro Software Systems. Each pack contains three games: Casino Games, Fun 'N Games I, Fun 'N Games II, Board Games, and Graphic Games. Each is available for \$29.95 per package of three games. Include \$1.50 per pack for postage and handling to Micro Software Systems, 444 North Grove Drive, Alpine, UT 84003.

AVAILABLE FREE: COMMUNICATOR'S RESOURCE BIBLE

The January 1984 edition of the *Black Box(R) Catalog* is free for the asking. Over 300 problem-solving products designed to enhance data communications and computer operation capabilities is featured in this 112-page book.

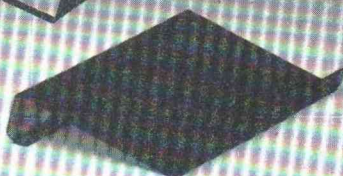
The Black Box product line ranges from basic installation hardware like cables and data switches to sophisticated modems and line drivers. Each product is described in detail with photos, diagrams, and prices.

To obtain your free copy, write Black Box Corporation, P.O. Box 12800, Pittsburgh, PA 15421, 412-746-5500. ◀



PORTABLE COMPUTER DESK TOP STAND

THE POCO STAND



\$17.95

by DISKUS™



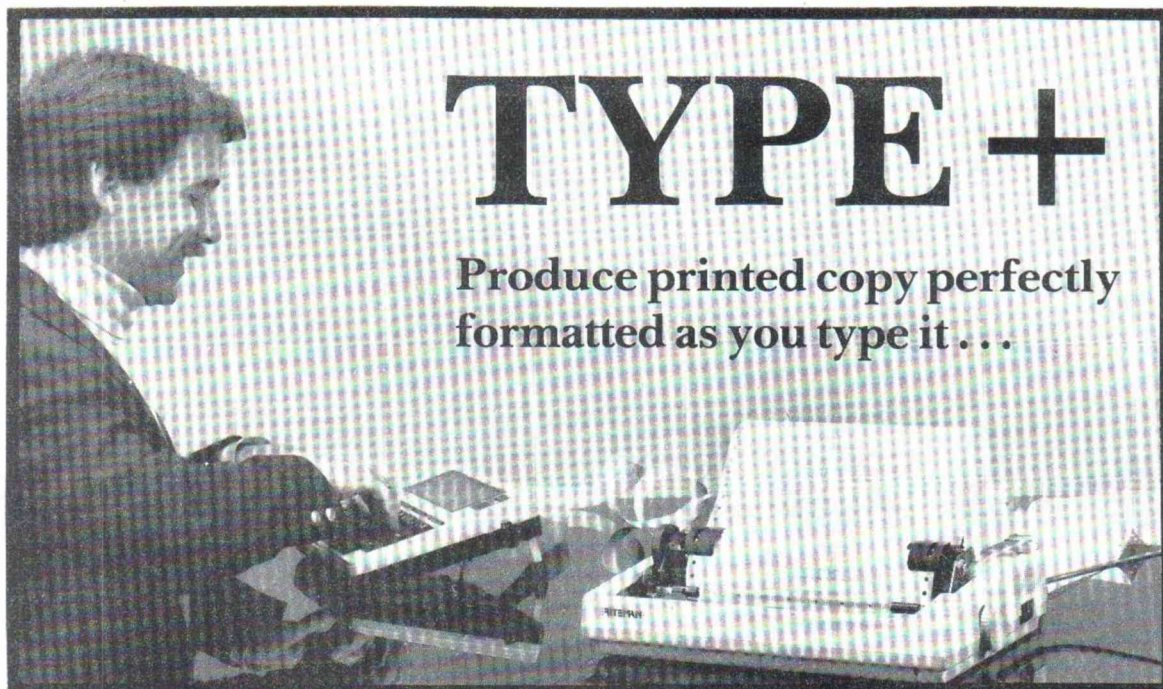
Improves Viewing and Typing Angle

Briefcase Portable

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YOU WILL NEVER USE TEXT AGAIN... TO ORIGINATE A DOCUMENT



TYPE +

Produce printed copy perfectly
formatted as you type it...

YOUR MODEL 100 PLUS ANY PRINTER BECOMES THE MOST FEATURE-RICH ELECTRONIC MEMORY TYPEWRITER YOU CAN BUY

TYPE+ is an exciting new program from **PCSG** that completely changes the way you use the Model 100.

Simply put the cursor on **TYPE+** on the Main Menu, press **ENTER** and you are immediately typing directly on your printer.

It lets you generate and create documents on your printer as finished copy. You see it as it comes from the computer and you can arrange it the way you want, right on the paper.

Fantastically, everything you type is stored in a **.DO** text file. You set the margins, left and right. Paper feeds automatically into the printer with a function key setting.

A screen buffer that you control, allows you to view your last line before it goes to the printer. You can set the

screen view area from an entire line of characters to one word to immediate print as you desire.

You can send the text to the file formatted as you typed it, or unformatted for less memory consumption (if you send it unformatted you can format it with **SCRIPSIT 100**).™

You have features for word processing that you thought were missing. For example: full **TAB** control, you set as many as you want, where you want them, with a function key, automatic centering of words or phrases, on and off with the function key.

Everyone who starts to use **TYPE+** is immediately addicted. We have heard the statement "I'll never use **TEXT** again to write a letter," from every per-

son who has used the program.

Other comments from users show us that this is a very logical method of generating a document. You are creating it and seeing it on paper, but you're also writing it to memory at the same time so that you can edit what you have created any time you wish.

The use of the function keys in this program will amaze you. You can right justify, set margins, underline, do bold-face print, on any printer, all with function key switches, (no control codes to look up and enter).

You will love this program. We honestly got rid of our typewriters. You will wonder why this concept hasn't been done before. It is the logical way to create a document.

PORTABLE COMPUTER SUPPORT GROUP

Type + is part of Business pack II

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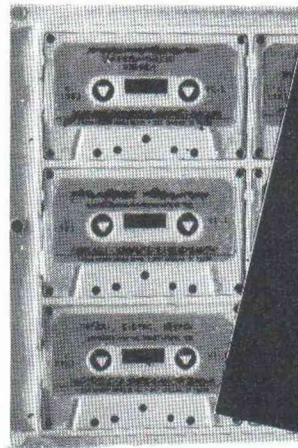
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Again PCSG provides for your Model 100 programs that turn your computer into a far more powerful business tool. Picture what you could do with these programs.

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TELEX++: New super Telex sending program that enables you to send Telexes and Mailgrams from any phone in the country using nationwide toll-free number with automatic verification of receipt instantly.

CALNDR: Generates up to an 18 month calendar. Prints out full sized calendar pages with events you schedule, detailed in each day's box. Print single week, month, year or 18 months. Records accessible on screen as well. Print out looks like page of conventional wall calendar.

TYPE+: The Model 100 now becomes, with the addition of any printer, the finest, most feature rich, electronic typewriter available today. You can type directly to the paper (some printers have a one line buffer). Underlines, and

does bold-face print on any printer with function key (no control codes to look up or embed). Right justifies at the touch of a function key.

BRKEVN: Analyzes your business, or any business proposition. You enter cost of each raw material, detail of fixed costs and variable costs. Calculates point at which your business breaks even, or shows a profit or loss.

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Be the hero at meetings. When your associate says "We'll sell twice as many if we lower the price ten percent," you can key into your computer and quickly say "Yes, but we'll lose a dollar on every one we sell." And then print out a study of the whole price vs volume picture.

11035 Harry Hines Blvd. No. 207, Dallas, Tx. 75229

PCSG provides hotline software support for Model-100. Call 1-214-351-0564. Available now directly from Portable Computer Support Group. We endeavor to continue as The Leader in Software for the Model 100.

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Circle No. 72 on Reader Service Card

FULL-DUPLEX

TERRY KEPNER



Editor's Note: Full-Duplex is dedicated to solving reader's Model 100 problems. Readers needing assistance should address their letters to: Terry Kepner, c/o Portable 100, 67 Elm St., Camden, ME 04843

CHINESE WORD PROCESSING

I use my Model 100 to write in Chinese for Chinese magazines. The 100 is an efficient tool, but I'm encountering some difficulties in formatting the output to a printer.

First, I bought a Chinese character generator board. It is connected to the 100 via the RS232 port.

Each Chinese character is generated by typing on the 100's keyboard a group of one to five lowercase letters. The adapter board takes these groups and

displays the Chinese character they define on an Amdek monitor.

Sending CHR\$(6) from Basic activates the printer function of the Chinese character generator board. With the board and the rules for making valid Chinese characters, you can generate up to 24,000 different characters.

Now for the problems.

The Amdek monitor supports a horizontal line of 26 Chinese characters — exactly the right length for Chinese writing. This represents a line length of up to 155 ASCII characters on the Model 100, since each Chinese character is defined by one to five Roman characters, plus two spaces between the groups for separation purposes.

When using the print feature of the Model 100, the maximum line length is only 132 characters. The result is aw-

fully ragged lines on the Amdek and Epson FX-80.

In the September issue of *Portable 100* was a program called Text Helper. I tried it using a right margin of 155, but it only works right if I put a carriage-return after every 26th Chinese character. This is terribly time-consuming, since I often miscount the groups on the 100's small display and always must redo them.

A friend told me it would be possible to write a program to count the groups of Roman characters and insert the carriage-return after the 26th one. It would have to take into account that sometimes there's a voluntary carriage-return inserted in lines with less than 26 groups.

The second problem is, each group of characters must be separated by two

```

10 MAX FILES =2
   : CLEAR 600
   : CLS
20 PRINT " Roman-to-Chinese
   Character File Scan"
30 FILES
   : PRINT
   : INPUT "Name of file";Z$
40 OPEN Z$ FOR INPUT AS 1
50 OPEN "RAM:NEWTXT.DO" FOR OUTPUT
   AS 2
60 A=0
70 IF EOF(1) THEN CLOSE
   : PRINT @280,"Total number of
   words is"A."
   : GOSUB 250
   : RUN
80 LINE INPUT #1,A$
90 B=0
100 C=INSTR(B+1,A$," ")
   : GOSUB 230
   : IF B=LEN(A$) THEN 70
   ELSE IF B>C AND C<>0 THEN 100
110 IF D=0 THEN 140
120 D=0
   : IF C=0 THEN PRINT #2,A$
   : A=A+1
   : E=0
   : GOTO 70
130 IF LEFT$(A$,1)<>" " THEN PRINT #2,
   MIDS$(A$,B+1,C-(B+1));
   : GOTO 190
   ELSE 190
140 IF C=0 AND LEN(A$)=255 THEN D=1
   : PRINT #2,MIDS$(A$,B+1,
   LEN(A$)-B);
   : GOTO 70
150 IF C=0 AND B=0 THEN
   : PRINT #2,A$

```

```

   : A=A+1
   : GOTO 70
160 IF C=0 AND B<255 THEN PRINT #2,
   MIDS$(A$,B+1,LEN(A$)-B)
   : A=A+1
   : E=0
   : GOTO 70
170 IF C=0 AND LEN(A$)<255 THEN PRINT
   #2,MIDS$(A$,B+1,LEN(A$)-B)
   : A=A+1
   : E=0
   : GOTO 70
180 PRINT #2,MIDS$(A$,B+1,C-(B+1));
190 A=A+1
   : E=E+1
200 IF E=26 THEN E=0
   : PRINT #2,
   ELSE PRINT #2," ";
210 B=C
   : PRINT @280,USING "Word Count =
   #,###";A;
   : IF D=1 THEN 70
220 GOSUB 230
   : IF B=LEN(A$) THEN 70
   ELSE 100
230 IF B<LEN(A$) THEN IF MIDS$(A$,B+1,
   1)=" " THEN B=B+1
   : GOTO 230
240 RETURN
250 PRINT @281,"Press <ENTER> to
   continue, M for MENU";
260 A$=INKEY$
   : IF A$="M" OR A$="m" THEN MAX
   FILES =0
   : CLEAR 0
   : MENU
270 IF A$<>CHR$(13) THEN 260
   ELSE RETURN

```


Micro Demon brought you three sensational programs...

Here's four more!

1 ASM - A Powerful 8085 assembler. ASM contains all the features you expect in an assembler as well as several features that are specific to the model 100. For instance, there is a built-in macro library that will simplify writing code. Among these macros are relative branch instructions for programs intended to be called from BASIC. ASM comes with extensive documentation, including lots of information on the ROM. Example programs will help the novice get started with machine language programming. The perfect way to learn about machine language.

2 TEL PRO - A TELCOM enhancement. With TEL PRO you can remain connected to the phone line and still read the menu, kill files, read text files, upload BASIC programs (with .BA extension), download the screen, access the time, set an alarm, delete unwanted carriage returns from downloaded BASIC programs, and more. An excellent companion program for PRO AID.

3 Questn - Artificial intelligence with a sense of humor. Ask this program any question, and it will respond with a relevant, often humorous reply. Philosophical and personal questions are the best. A nice program to show off your computer. Requires at least 24K memory. Questn comes with a list of questions for those who have trouble thinking of something to ask.

4 Napoleon - It's you against the computer. In this card game from England, each player gets a bid and the high bidder tries to make his contract. The computer makes a worthy opponent. You can choose the computer's style of play.

Send mail orders and requests for information to Micro Demon, Inc., P.O. Box 50162, Columbia, SC 29250. Visa and Mastercard are welcome. Or, call our 24 hour order line, 803-733-0980.

PRO AID, DASM & Music

PRO AID - Still our number one product. PRO AID is a machine language program that adds many powerful features to your model 100. You get 26 new, easy to define, super function keys that can be used in TEXT and TELCOM as well as BASIC. You also get automatic line numbers, instantaneous deletion of any range of BASIC lines, a special calculator mode with new BASIC commands, immediate access to MENU programs, a program status key, and much more. PRO AID uses less than 1.8K of your memory, and can be located anywhere there is room. PRO AID comes with complete documentation.

DASM - A full featured disassembler. You can easily follow the logic of a program that contains many jumps and calls. During the disassembly process, you can inquire about such things as contents of memory, and the keyword for a given token. The latest version has a split-screen feature that allows you to review the previous 8 lines of disassembly.

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spaces. Using one space makes the Chinese characters appear too close together. I'm a touch typist and sometimes forget to press the space bar twice after each group. Trying to locate the places where I forgot to space properly is time-consuming and frustrating. I've been told a program could be written to do this for me. Can you help?

Caroline Chin
New York, NY

►Your advisor is correct. Basic programs can be written to solve both problems.

The first problem arises because one line of 26 Chinese characters can have anywhere from 26 to 155 Roman characters and conventional word processors look at the length of each line in total Roman characters.

Both programs are simple in concept and could easily be combined. See listing 1 for such a program.

This program requires room in memory for two documents. It reads the first one, and writes a second one with all the corrections added.

If you don't have enough room to do that, plug in your tape recorder and

change the second open statement (line 50) to read OPEN "CAS:TEXT" FOR OUTPUT AS 2. This will make the program read your target file, and save the corrected file to tape. Now you can load the corrected file into memory and proceed to print it out.

The program works very simply: It reads one line of your text file into A\$ (where one line is determined as everything up to a carriage return or 255 characters, whichever occurs first) and scans through A\$ looking for the blanks between "words". As each of these is found, it's counted and written to another file. If the word count is under 26, two spaces are added to the end of the word, and the next word in A\$ is examined. If there isn't another word, or that was the 26th word since the last carriage return, a carriage return is sent, and the next line of the second file is started.

The variable C indicates the position of the next blank in A\$, or that the last word has been found. B is the start position of the current word, and E is the number of words written since the last carriage return. D indicates the previous A\$ was 255 characters in length

and that it's a continuation of the current line. A is used to count the total number of words in the file, so as a bonus the program will tell the number of Chinese words in your text file, which, as a writer, I'm sure you'll find useful.

BATTERY QUESTIONS

How can I prolong the life of the nickel-cadmium batteries over and beyond their limit of eight days for a Model 100 with 32K?

Fred Forrester
Santa Barbara, CA

►As long as you leave the Model 100 plugged into the AC adapter (which is plugged into the wall socket), the batteries are not used. You can actually remove the batteries from the Model 100 and power it entirely from the AC adapter (I don't recommend doing this).

Depending on who you talk to, some technicians insist the batteries are recharged by the external AC adapter when it's used, others say the batteries aren't recharged. I tend to believe that the batteries aren't recharged in the Model 100. ◀

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AMPI's *AmericanCalc Spreadsheet*—designed TPlan for the Radio Shack TRS-80 Model 100, and NPlan for the NEC PC-8201A—is a full-feature spreadsheet program. It has the following features: handles up to a maximum of 90 rows or 26 columns; cursor movement is left, right, up, down, and go to any location; accepts data entries for numbers, labels, and formulas; formulas include addition, subtraction, multiplication, division, power, trigonometric, integer, absolute, natural logarithm, and exponentiation; replicate numbers or formulas; insert or delete rows or columns; copy, save, load, and screen dump; and built-in calculator. The program is shipped with bound instruction manual, pre-recorded audio tape, and vinyl album case.

This popular spreadsheet now has three new templates especially designed for busy people who do not have the time to set up their own spreadsheet applications. Once the TPlan or NPlan is loaded, simply select and load the application template that fits your particular need. The three new templates are:

Financial Management — Includes T Plan and N Plan application templates for: Stock Portfolio, Home Ownership, Home Budget, Life Insurance Requirement, and Personal Check Register.

Business Management — Includes T Plan and N Plan application templates for: Income Statements, Balance Sheets, Business Start-up, Break-even Quantity, and Expense Analysis.

Sales and Marketing Management — Includes T Plan and N Plan application templates for: Sales Forecast, Profit Mark Up, Sales Analysis, Project Cost Estimate, and Advertisement Efficiency Measurement.

AMPI also has available several additional new software programs for the Radio Shack TRS-80 Model 100 and NEC PC-8201A. These include: Income Property Analysis, Portfolio Analysis, Curve Fitting, Histogram and Plot, Equation Solver, RPN Calculator, and FORTH.

Write for free catalog listing additional Radio Shack TRS-80 Model 100 and NEC PC-8201A business and engineering programs.



AMERICAN MICRO PRODUCTS, INC.
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continued from page 88

Far from exposing the ills of this industry, the computer-print media embodies them. These magazines typically aren't more than public relations devices and are themselves a large component of the problem. There are a few exceptions but the dominant editorial content is paid and unpaid advertising, and it often seems editorial policy is a direct extension of advertising sales. The priority is to coddle and protect advertisers rather than inform users.

Patiently waiting for the shakeout and the promised maturity doesn't offer much hope. So long as the industry and the media which support it are obsessed with tomorrow's innovative technological breakthrough, all of the retooling will be in the factory, and not where it's needed — in the office.

SATIATED. There's been more than enough innovative technology during the last five years to sustain me for the

next 20. The products I already own have capabilities so in excess of my needs, that the unused power dwarfs the actual benefits.

Try to find a decent and reasonably-priced accounting program for a small business to run on a 16-bit computer. I don't have 65,000 customers, 20,000 vendors and 12 checking accounts, and don't need a program which can accommodate them. Users' needs would be better served by working on the existing technology so it's more accessible, more relevant, and more durable.

It is against this backdrop that my column, End User will be written. I'm strongly committed to the value of computers for the everyday person, and it's with equal intensity that I reject the way the industry now deals with us. The sole purpose of this column will be to champion the cause of end users, with special emphasis on those who have lap-sized portable computers. My only concern is the products and ser-

vices offered end users be sensitive to their needs in all respects: form, function, ease, size, and price.

WITCH TRIALS. I don't embody the broad range of perspectives of all end users, so please help by writing me yours.

Portable 100 has to be recognized for providing (even paying for) this forum. Rather startling. Mark Twain thought the essential difference between a dog and a man was that if you gave a hungry dog something to eat, the dog wouldn't bite you. Twain correctly suspected man to be less appreciative.

Next month's column will take a critical look at *Portable 100* (subtitled, Biting the Hand that Feeds You). The following month Tandy and NEC will discover their transgressions haven't gone unnoticed. Next, CompuServe, the company who defines customer service as a busy signal, will be on the block. And then ... ◀

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3M

END USER

PETER STANWYCK



BEWARE A CUSTOMER BY ANY OTHER NAME AND THE RISE OF BIG NERDNESS

This column is titled end user because that's what the computer industry calls its customers. We are not end users of cars, deodorant, or peanut butter. Professional sport franchises don't call us customers either; for them we are fans. Beware of industries that don't call their customers "customer." Evidently, as long as we're not called customer, different rules apply.

BIG NERDNESS. End user is an apt term if what is being described is the point when customers are considered in determining the content of the products we are asked to buy.

How well I remember those intrepid few in high school who wore K & E slide rules holstered to their belts. (A slide rule, for those born after its extinction, consisted of two sticks rubbed together to make numbers.) Those lonely geniuses were anti-social then, and their personalities did not improve with age. Not generally known as trend-setters, they set the tone for the computer revolution.

Big Business woke up one morning and found itself surrounded by some very rich nerds, and an odd merger was negotiated where each could contribute his worst attributes to a joint effort: Big Nerdness.

Big Business knew the paying customer had something to do with selling products, but evidently only believed all that was missing from the relationship was a slick promotional campaign. Madison Avenue was given the job of getting to know us, the paying customer.

MADISON AVE. To believe the current ad campaigns is to know there isn't

a human problem which can't be solved by a pinkie finger, a function key, and a graph on a computer screen.

Which ads you hate most are largely a function of personal distaste. It's hard for anyone to surpass Apple's pretense.

Leading Edge certainly tried with "History will record the profound irony that the most powerful word-processing package ever created for the IBM Personal Computer wasn't created by IBM." My history degree from Bezerkeley notwithstanding, I sense history won't notice this product.

If your thing is the visually bizarre you are in the right place. Autocode proves its value by plopping a melting scoop of raspberry ripple ice cream on a floppy disk. Multiplan turns its floppy into oil sludge and spreads it on toast so that you know its spreadsheet doesn't spread too thin. Gack!

IBM? Just who's in charge of product values and criteria? They continue to say IBM. It's amusing that IBM selected a Chaplinesque spokesperson for its media image. Someone who doesn't speak hardly can reflect IBM as accurately as someone who doesn't listen.

Consider the range of disciplines IBM pulled together to develop its Junior Peanut (or whatever they call it). All those smart people took all that time and collected all that information. When they finished, their long anticipated and much ballyhooed conclusion: Users want an infrared keyboard. The guy who invented the electric fork must have gone to work for IBM, or perhaps they were testing a defective artificial intelligence program. "IBM Computability" should be the name of a computer dating service and nothing else.

ELECTRONIC JUNGLE. The computer marketplace isn't dazzling. It's dizzying to the average consumer, made more frightening by the lack of adherence to even the most basic ethical standards; standards which the American consumer takes for granted.

Products are offered for sale when they aren't available for distribution; products on the retailer's shelf are often untested and flawed; documentation for products bought is written by receptionists or junior programmers; we're led to believe what we just paid for just became obsolete; and the universal answer to every question is: "We're working on it." These four words will soon enjoy the same status as "The check's in the mail."

While the industry's purpose may be to sell computer products, we have no purpose to buy them. Users want to solve problems and accomplish goals, as they see and define them. Computer products are only tools, and the only measure of their value as tools is whether they work for us and on our terms. A computer product which doesn't solve the problem just becomes another problem to solve.

CATCH 22. The industry has developed its own Catch-22 for problem solving which I call the End User Loop:

Call the dealer and hear "Call ya back real soon, I'm with a customer now." (Translation: "You're last month's commission.")

Call the software company and hear: "Sounds like a hardware problem to me."

Call the hardware company and hear: "We don't deal with end users directly, call your dealer." HELP!

Will the Fourth Estate protect us? At last count, the small smoke shop in my office building sells 23 magazines wholly dedicated to the computer marketplace. Surely these journalists will fulfill their historic role of watchdog, protector of the weak and oppressed. You bet!

continued on page 86

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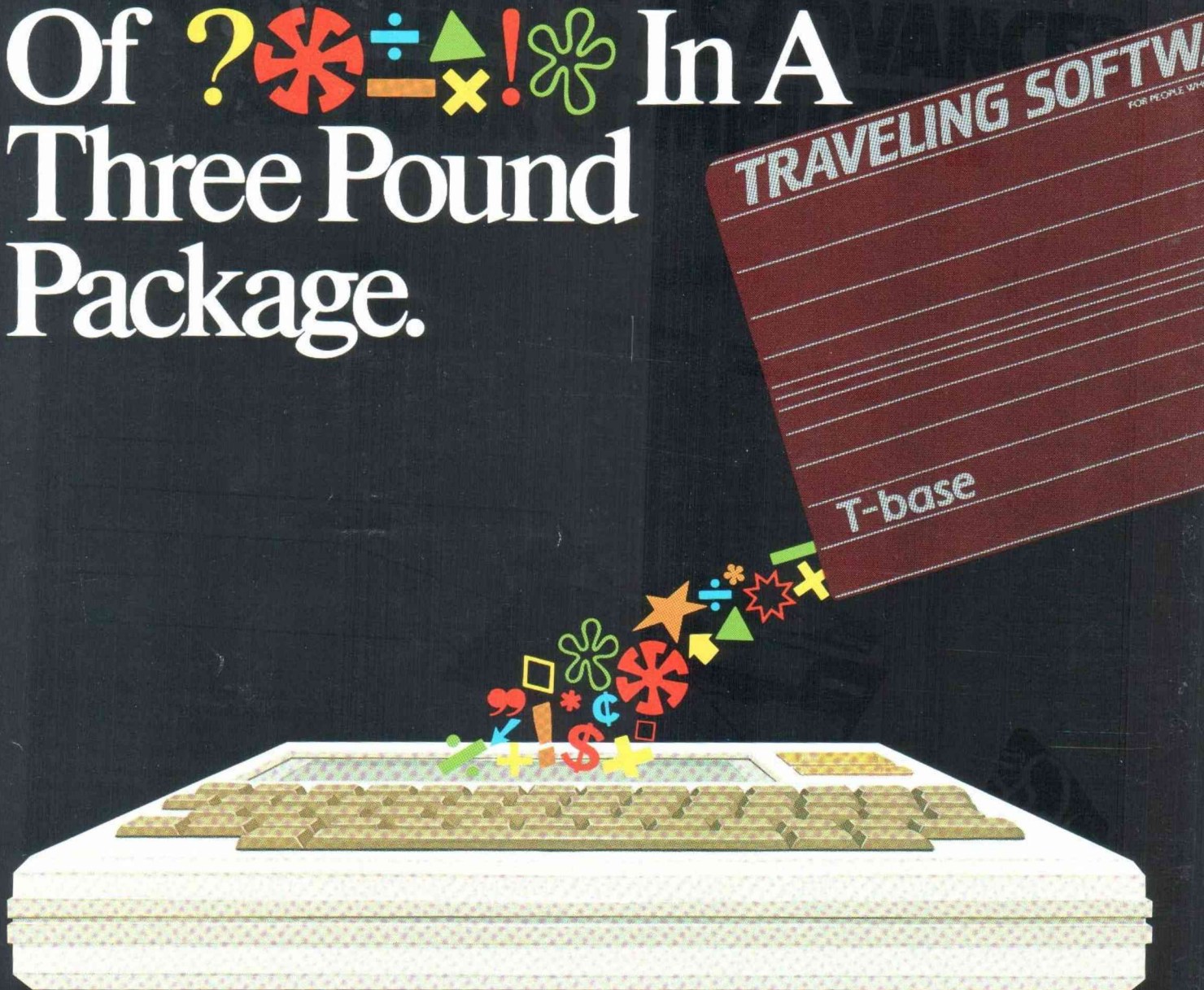
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